

PHILIP MORRIS U. S. A.

INTER - OFFICE CORRESPONDENCE

Richmond, Virginia

To: .Strategic Planning Committee Date: July 20, 1987
From: .E. B. Sanders *EB*
Subject: .Status Report on the Progress of Development of the R&D Strategic Plan

The goal of the Strategic Planning Committee was to have completed the Mission Statement and Situational Analysis by June 15 and present this information at the June Planning Meeting. This status report summarizes in writing our accomplishments as of June 15.

The Committee had decided previously that Situational Analysis should be divided into two parts - internal and external. The internal analysis should cover PM USA R&D programs and PMI and TTG programs as well. External analysis should cover competitors, government and society, suppliers, and outside technology.

In order to obtain the most accurate data possible regarding internal programs questionnaires were sent to all R&D Managers which asked for the following information: 1) list all projects or programs which were being worked on in the Division; 2) give the customer for each program; 3) give the objective of the program; 4) indicate the estimated completion date if it was a short term program, or intermediate milestones with dates if it was a long term program; and 5) specify the number of people associated with the program and the skills being used. This information was summarized for each Division, and the summaries are given in Appendix A. In addition resource allocation data were obtained which included the percentage of R&D personnel working on major programs (54.6%), other programs (14.7%) and support which could not be clearly allocated to a program (30.7%). The total personnel allocated to each major program and the number of Divisions involved are given in Table 1. The largest program in terms of personnel is Operations Support with 60.6 people, while the smallest is Bonded Ends with 5.6 people. Number of Divisions involved range from 15 for Project ART to 2 for Bonded Ends and TSNA. A listing of other programs is given in Table 2. An interesting observation is that other programs in Development tend to be numerous, with small numbers of people working on each one, while in Research they tend to be fewer with larger numbers of people involved. Lastly each Division's contribution to unallocated support is given in Table 3. The Divisions with the largest contribution of unallocated support are Development Engineering, Tobacco Processing and Fundamentals, Analytical Research, CAD, Administrative Services, Cigarette Testing and TIS.

Some interesting conclusions were drawn from an examination of the responses to the questionnaires. The first was that there were multiple customers for each program depending on in which Division the work was being carried out. In certain cases this is a natural consequence of the flow from Development to Research. In other cases, however, it appeared that there was

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Table 1
Resource Allocation Summary
for R&D Major Programs

<u>Program</u>	<u>Total Personnel</u>	<u>No. of Divisions</u>
Menthol	16.7	7
LD/HT	17.7	10
Project ART	37.2	15
Reduced Density Rod	26.0	11
Ignition Propensity	6.7	6
Sidestream Control	14.7	7
Int. Prod. Support	37.7	8
Operations Support	60.6	10
Optimization of Recon	17.2	7
Alternate Humectants	8.3	7
Bonded Ends	5.6	2
TSNA	7.6	2
Lowered Biol. Activity	17.1	3

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Table 2
Summary of Other R&D Programs by Division

- A. DOMESTIC PRODUCT DEVELOPMENT (0.5)
- B. INTERNATIONAL PRODUCT DEVELOPMENT (0.0)
- C. CIGARETTE TECHNOLOGY (11.8)
 - 1. Storage Studies (0.5)
 - 2. Product Monitoring Studies (0.5)
 - 3. New Package Materials Evaluation (0.5)
 - 4. Cigarette Component Investigations (1.5)
 - 5. Menthol Application (0.5)
 - 6. New Filter Concepts (1.5)
 - 7. New Packaging Development (1.0)
 - 8. New Cigarette Concepts (1.5)
 - 9. Marlboro Standardization (0.8)
 - 10. Flavor Encapsulation (1.0)
 - 11. New Instrumentation (1.5)
 - 12. Other Projects (1.0)
- D. FLAVOR DEVELOPMENT (7.3)
 - 1. New Products (0.8)
 - 2. Sweeteners (1.0)
 - 3. New Filter Concepts (0.5)
 - 4. Distinctive Flavors (0.5)
 - 5. Brand Modification (0.5)
 - 6. Flavor Specifications (0.9)
 - 7. Non-Volatile Flavor Investigations (1.2)
 - 8. Marlboro Standardization (0.6)
- E. PED (3.0)
 - 1. Competitive Testing (0.5)
 - 2. Testing Research (2.5)
- F. DEVELOPMENT ENGINEERING (4.6)
 - 1. -Robotics (2.5)
 - 2. CI (0.7)
 - 3. Electrophysiological Studies (0.6)
 - 4. Economic Studies (0.8)
- G. TOBACCO FUNDAMENTALS (1.0)
 - 1. Firmness While Smoking (0.8)
 - 2. Coal Strength (0.2)
- H. TOBACCO MATERIALS DIVISION (4.1)
 - 1. Diet Development (2.2)

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- 2. Strip Unfolding (0.5)
 - 3. Superheating Cut Filler (1.3)
- I. TOBACCO PROCESSING (0)
- J. CHEMICAL RESEARCH (10.4)
 - 1. Flavor Research (4.2)
 - 2. Health Physics (2.0)
 - 3. Greenhouse Research (3.3)
 - 4. MDL Program (0.5)
- K. ANALYTICAL RESEARCH (10.7)
 - 1. Oven Volatiles (2.8)
 - 2. Methods Development (3.6)
 - 3. Glycoproteins (0.9)
 - 4. MDL (0.9)
 - 5. Blend Composition (2.4)
- L. BIOCHEMICAL RESEARCH (8.0)
 - 1. Entomology Research (5.0)
 - 2. Electrophysiological Research (3.0)
- M. PHYSICAL RESEARCH (0)
- N. BIOMATERIALS SCIENCE (0)
- O. CAD (0)
- P. ADMINISTRATIVE SERVICES (0)
- Q. CIGARETTE TESTING - CI (12.0)
- TOTAL - 73.4

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Table 3
Unallocated R&D Internal Support
by Division

A.	DOMESTIC PRODUCT DEVELOPMENT (0)
B.	INTERNATIONAL PRODUCT DEVELOPMENT (0)
C.	CIGARETTE TECHNOLOGY (1.0)
D.	FLAVOR DEVELOPMENT (2.6)
E.	PED (0)
F.	DEVELOPMENT ENGINEERING (13.7)
G.	TOBACCO FUNDAMENTALS (6.0)
H.	TOBACCO MATERIALS DIVISION (7.2)
I.	TOBACCO PROCESSING (14.0)
J.	CHEMICAL RESEARCH (2.5)
K.	ANALYTICAL RESEARCH (12.4)
L.	BIOCHEMICAL RESEARCH (0)
M.	PHYSICAL RESEARCH (0)
N.	BIOMATERIALS SCIENCE (0)
O.	CAD (29.0)
P.	ADMINISTRATIVE SERVICES (44.0)
Q.	CIGARETTE TESTING (12.0)
R.	TIS (9.0)
	TOTAL 153.4

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considerable doubt as to who the customer really was. A second interesting observation was that virtually all completion dates were either in 1987 or 1988. For many programs, however, completion will not be achieved until considerably later. This is probably diagnostic of good short term planning but missing long term planning.

The second area of internal analysis which was to be examined was an assessment of the impact of TTG and PMI R&D programs on USA R&D. Conversations were held with Mr. Paddy O'Brien, President of TTG, and Mr. Lyle Cooper, TTG Director of Far East and Australia. Both individuals felt that the major overseas growth areas are menthol products and American blends. In addition it was pointed out that with respect to the third world countries, economics is of paramount importance. One need which was clearly perceived was for new tobacco processes which are not capital intensive and do not require high technology to maintain. Other product concepts which were felt to be important were low delivery cigarettes, slow release agents in the filter, new packaging concepts, sweeter sidestream aroma, Project Trim, total blend expansion and reduced density rods.

It was not possible to develop a meaningful understanding of FTR R&D objectives and how these relate to PM USA R&D strategic goals by simply reading quarterly reports. Consequently an analysis of PMI R&D has not yet been conducted. This omission will be corrected during the week of July 27 at which time one of the members of the Committee will be visiting FTR.

The first portion of external analysis which will be discussed deals with PM USA's competitors. A competitive profiles file has been developed and is included in Appendix B. This file at present contains a summary of financial data, relevant organizational charts, biographies on key R&D personnel, patent and publication data, and a list of each competitor's non tobacco subsidiaries. It should be pointed out that much of the financial data pertaining to our competitor's R&D efforts has had to be derived from a careful analysis of overall financial data. Estimates of competitor's R&D budgets for 1985 are given in Table 4. In the future this file will also contain abstracts of publications, abstracts of patents, continuous updates on data already included, and information derived from PM USA R&D employees obtained from contacts with competitor's employees at meetings and seminars.

An analysis of social and governmental influences which are of importance to PM USA was carried out and is given in Appendix C. This analysis concerned itself with 1) social acceptability of smoking and the increased restrictions which are accompanying decreased acceptability; 2) product liability; 3) cigarette taxation; 4) advertising and promotion issues; and 5) self extinguishing cigarettes. The conclusion of this analysis is that the above factors are of considerable importance and constitute both threats to the industry and opportunities for potential new products.

A list of suppliers on which R&D is dependent was developed. It is shown in Table 5. Our dependence on these suppliers can be easily demonstrated using a few examples. We rely completely on the paper manufacturers such as Ecusta and Kimberly Clark for the preparation of cigarette papers for the Reduced Sidestream Program. Ideas generated at R&D for new types of experimental papers for reduced sidestream cannot be followed up internally since we do not have the equipment for making such

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Table 4

PM USA Competitor's Estimated
R&D Budgets for 1985

<u>Company</u>	<u>1985 R&D Budget</u>
RJR Nabisco	\$50-60 million
B&W	\$20-25 million
Lorillard	\$12-15 million
American	\$10-12 million
Liggett	--

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Table 5

Suppliers Upon Which R&D is Dependent

1. Ecusta Paper Co and Kimberly-Clark Paper Co are our tobacco major sources of both commercial and experimental plug-wraps, tippings and cigarette papers.
2. De Mauduit is a minor supplier of cigarette wrap; Dexter of plug-wrap.
3. Celanese and Tennessee Eastman are our suppliers of CA tow and also supply experimental filter materials.
4. Fuller, Findley, Upaco and National: supplier of adhesives to R&D.
5. Calgon: charcoal supplier.
6. Alfred Packaging: packaging supplier for new, innovative packaging materials such as in "Fresh" Pack.
7. Reynolds Metals: packaging supplier.
8. Mobil, Hercules: polywrap supplier.
9. Hermetite, Ecusta, Golden Belt, Colonial Heights: tipping converters.
10. Filtrona Limited: new instrumentation.
11. American Filtrona: new filter materials, processing and new filter concepts.
12. Jewett's, Anderson Machine Shops: local machine shops utilized in product innovations to produce specialized equipment not available in-house.
13. Flavor houses: Givaudan, IFF, Firmenich, Fritzche, Takasago, Naarden, Norda, PFW.
14. Hauni, Molins: equipment suppliers-tippers, plug-makers, cigt. makers. Supply specialized parts for these units to make Ultra Slim cigt. (17mm circ.) for instance. Will also supply experimental equipment as warranted.

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papers. New types of filter towers which might allow selective filtration cannot be done without involving either Celanese or Tennessee Eastman at the inception of such a study since we lack tower making equipment and experience. Lastly, we have been totally dependent on outside flavor companies for our flavor needs despite considerable capability in house.

The last part of external analysis which was carried out involved an analysis of areas of needed technology. The list that has been generated at this time is given in Appendix D. Refinement and focusing of this list will be carried out as the strategic plan develops.

Based on our current internal analysis a list of internal strengths and weaknesses was developed (Tables 6 and 7), and a list of external threats and opportunities was developed from our analysis of external factors (Tables 8 and 9). The internal strengths and weaknesses were used to develop a list of recommendations which are as follows. 1) More long range planning is needed. It is recommended that a long term plan for the low delivery/high taste program be developed with input from appropriate management, technical personnel and planning personnel. 2) The resource allocation summary of every major program will be distributed to the appropriate coordinator. 3) Support requests for work on a major program should be routed through the program coordinator or an individual designated before hand. 4) Principal and Associate Principal Scientists should be involved in strategic planning aspects. 5) A goal should be established to educate key technical personnel with respect to tobacco processing and manufacturing technology.

As all of you will know by the time you receive this document, our timetable has been changed. It is necessary at this point to have a complete strategic plan for at least five years by September 1. Achieving this objective may well require even more time in the next six weeks than originally anticipated. I must stress, however, that our objective is of the utmost importance, and whatever is needed to be done has to be done.

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Table 6

List of Internal Strengths Generated by the
Committee Based on Internal Situational Analysis

1. Broad scientific base
2. Rapid response to short term goals
3. Good short term operation plans
4. Well placed university contacts
5. Very good physical resources
6. Money available for justifiable programs
7. Considerable multi-division interactions
8. Reasonable bootlegging allowed
9. Good understanding of conventional cigarette construction
10. Local Mfg./Eng./Computer support services

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Table 7

List of Internal Weaknesses Generated by the
Committee Based on Internal Situational Analysis

1. Insufficient long range planning
2. No international process development
3. Lack of new blood
4. Poor communication of role and mission to the bench level
5. Undermanned in Product Dev. level - project
- support
6. No long term (5 yr. +) "Product" development
7. Lack of competitive intelligence
8. Barriers to technology transfer
9. Physical separation of facilities
10. Lack of knowledge of cigarette manufacturing and processing by bench scientists
11. Too much reliance on suppliers

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Table 8

List of External Threats Generated by the
Committee Based on External Situational Analysis

1. Upward taxation pressure
2. Government regulation of cigarette construction
(Ing. Prop.)
3. Government regulation of additives
4. Social unacceptability
5. Foreign competition
6. Product liability
7. Technical obsolescence of product
8. Rapid expansion of price value at expense of full
margin
9. Potential smoking/health link
10. Limitation or ban on advertisement
11. Potential product tampering

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Table 9

List of External Opportunities Generated by the
Committee Based on External Situational Analysis

1. Reduce the cost of manufacturing
2. International market demand
3. Menthol products
4. Product with perceived health benefits
5. Growing ethnic markets
6. Proprietary processes
7. Environmental smoke abatement - design and specification
8. Product for former smokers

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APPENDIX A

**Summary of Major Programs Including Information
on Resource Allocation, Goals, Timetables and Customers**

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R&D MAJOR PROGRAMS (273.1)

A. MENTHOL

1. Total Personnel - 16.7
2. No. of Divisions involved - 7
3. Goals, Timetables, Customers
 - a. Domestic Product Development (3.0) - Successful free-standing menthol brand; 1987; Marketing
 - b. Flavor Development (2.4) - New product, successful consumer test; ongoing; Domestic Product Development, Marketing
 - c. Cigarette Technology (1.5) - Tube-in-Tow filter product, 1987/1988; Concentric filter product; 1988/1989; Pack aroma release concept; 1988/1989; Domestic Product Development
 - d. PED (1.5) - Show direction for potential new menthol, product testing; ongoing; Flavor and Product Development
 - e. Cigarette Testing Services (4.0) - Provide analytical support; ongoing; Domestic product development
 - f. Tobacco Proc. & Fabr. (4.2) - Semiworks Service; ongoing; requestor

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B. LOW DELIVERY/HIGH TASTE

1. Total personnel - 17.7
2. No. of Divisions Involved - 10
3. Goals, Timetables, Customers
 - a. Domestic Product Development (1.5) - Marlboro Ultra Lights, Nov. 1987; Project Extra; ongoing; Marketing, Consumer Research
 - b. Flavor Development (1.3) - New products, successful consumer tests; ongoing; Marketing
 - c. Cigarette Technology (1.5) - Tube-in-Tow Filter Product Transfer; Late 1987; Domestic Product Development
 - d. PED (1.0) - Mapping existing products; ongoing; Flavor Development
 - e. Cigarette Testing (0.5) - Provide analytical support and CI; ongoing; Domestic Product Development
 - f. Chemical Research (4.3) - Acetic acid release agent; 1987; new flavors and new flavor technology; ongoing; Flavor Development
 - g. Physical Research (2.8) - PVA/menthol system; 1987; Cigarette Technology
 - h. Analytical Chemistry (1.7) - Correlate tobacco volatiles with subjective characteristics; ongoing; identify pyrolytic decomposition components and patterns; ongoing; Flavor Development
 - i. Tobacco Proc. & Fabr. (3.0) - Semiworks Service; ongoing; requestor

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C. PROJECT ART

1. Total Personnel - 37.2
2. No. of Divisions Involved - 15
3. Goals, Timetables, Customers -
 - a. Domestic Product Development (2.0) - 11 mg product, 1987; Test Market, 1988; Marketing
 - b. Flavor Development (1.5) - External evaluation; ongoing; Marketing
 - c. Cigarette Technology (0.5) - Support; ongoing; Domestic Product Development
 - d. PED (1.5) - Evaluation of product, ongoing; Program Coordinator
 - e. Cigarette Testing (1.0) - Analytical Support; ongoing; Program Coordinator
 - f. Development Engineering (2.0) - Engineering Support; 1987; Manufacturing Engineering
 - g. Chemical Research (0.5) - Development of pilot scale process; 1987; Program Coordinator
 - h. Physical Research (6.0) - Optimize extraction conditions; ongoing; Engineering & New Products Directorate
 - i. Analytical Research (2.6) - Provide analytical support and investigate the mobility of nicotine in its native state; 1988; Program Coordinator
 - j. Administrative Services Division (1.0) - Mechanical and electrical support of stem line installation; 1987; Tobacco Materials Division
 - k. Tobacco Fundamentals Division (1.0) - Engineering support; 1987; Engineering
 - l. Biomaterials Science (7.0) - Isolation of putrescine methyl transferase; 1987; New Products Development
 - m. Biochemical Research (1.4) - Design procedures for safe disposal of SCFE adsorbers; 1987; Engineering
 - n. Tobacco Materials (6.5) - Supply shredded stems and develop means of utilizing spent stems; 1987; Pilot Plant operating team
 - o. Tobacco Proc. & Fabr. (2.7) - Semiworks Service; ongoing; requestor

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D. REDUCED DENSITY ROD

1. Total Personnel - 26.0
2. No. of Divisions involved - 11
3. Goals, Timetables, Customers
 - a. Cigarette Testing Division (1.0) - Analytical support; ongoing; Tobacco Fundamentals Division
 - b. Development Engineering (2.0) - Improving prototype equipment for pneumatic formed rod; ongoing; Tobacco Fundamentals Division
 - c. Physical Research (3.4)
 - (1) Identify desired characteristics of an optimum binder system, ongoing; develop thermal analytical methods for testing for reproducible processing conditions, 1987; Tobacco Materials and Tobacco Fundamentals Division
 - (2) Develop predictive models of mechanical properties of reduced weight rod, ongoing; characterization of MS delivery properties of reduced weight rods, 1987; solve firmness whole smoke problems, ongoing; identify optimum filter systems; Tobacco Fundamentals Division
 - d. Analytical Research (1.7) - Investigate cross section morphology of foam bound rod, 1987; develop QA procedures for degraded pectin, 1987; microscopic studies, ongoing; evaluate licorice alternatives, 1988; QA and Tobacco Fundamentals Division
 - e. Tobacco Fundamentals Division (13.0)
 - (1) Development of a -150 to 200 mg cigarette, 1987; development of a -300 mg cigarette, 1987; New Products Division; Engineering
 - (2) Development of a foam binder system which is subjectively acceptable, 1987; Product Development; Engineering; Manufacturing
 - f. Biomaterials Science (1.0) - Mechanical engineering support; ongoing; Tobacco Fundamentals Division
 - g. Tobacco Materials Division (2.0) - Develop a method to produce low molecular weight pectin, 1987; develop alternate foaming agents, 1988; foam-bound rod development team
 - h. Tobacco Proc. & Fabr. (1.3) - Semiworks Service; ongoing; requestor

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E. IGNITION PROPENSITY

1. Total Personnel - 6.7
2. No. of Divisions involved - 6
3. Goals, Timetables, Customers
 - a. Cigarette Technology (1.5) - Long range product development, 1988/1989; Domestic Product Development
 - b. Cigarette Testing (0.5) - Analytical support and CI; ongoing; New Product Development
 - c. Physical Research (3.3) - Develop the know-how to achieve lower ignition propensity with subjective acceptability, 1987; develop an acceptable Marlboro with reduced ignition propensity, 1987; Director of Research
 - d. Tobacco Proc. & Fabr. (0.7) - Semiworks Service; ongoing; requestor

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F. SIDESTREAM CONTROL

1. Total Personnel - 14.7
2. No. of Divisions involved - 7
3. Goals, Timetables, Customers -
 - a. Cigarette Technology Division (2.0) - Low sidestream product development, 1987/1988; non-burning smoking article and/or optional smoking device; 1988/1989; Domestic Product Development
 - b. Flavor Development (0.6) - Low sidestream product development; ongoing; Marketing
 - c. Chemical Research (7.5) - Develop an understanding of how currently available papers modify sidestream, 1987; develop additional models for sidestream reduction and select best model, 1988; Cigarette Technology Division
 - d. Analytical Research (0.5) - Investigate elemental morphology of the inner and outer surfaces of relevant cigarette papers, 1987; develop a chemical map of Mg in $\text{Mg}(\text{OH})_2$ papers, 1988; Chemical Research Division
 - e. PED (0.8) - Determine limits where consumer perceives a benefit; ongoing; Flavor Development, Product Development, Physical Research
 - f. Physical Research (1.6) - Identify mechanism of action for paper additives such as $\text{Mg}(\text{OH})_2$, 1987; design and construct cigarettes with optimum sidestream reduction and acceptable subjectives, ongoing; develop proprietary alternatives to $\text{Mg}(\text{OH})_2$, ongoing; Cigarette Technology Division
 - g. Tobacco Proc. & Fabr. (1.7) - Semiworks Service; ongoing; requestor

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G. INTERNATIONAL PRODUCT SUPPORT

1. Total Personnel - 37.7
2. No. of Divisions involved - 8
3. Goals, Timetables, Customers -
 - a. Cigarette Technology Division (0.5) - Scented tear tape; 1987; International Product Development
 - b. Cigarette Testing (16.0) - Analytical support; ongoing; PMI and International Product Development
 - c. Flavor Development (2.0) - New product development; ongoing; International Product Development; Marketing
 - d. Analytical Research (1.5) - Analytical Support; ongoing; Leaf Department
 - e. PED (0.7) - Establish and validate overseas testing panels; ongoing; International Product Development
 - f. International Product Development Division (7.0) - New product development; ongoing; PMI
 - g. Tobacco Proc. & Fabr. (9.7) - Semiworks Service; ongoing; requestor

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H. OPERATIONS SUPPORT

1. Total Personnel - 60.6
2. No. of Divisions involved - 10
3. Goals, Timetables, Customers -
 - a. Cigarette Technology Division (0.5) - Various; ongoing; unspecified
 - b. Physical Research (4.5)
 - (1) Tipping adhesive - rheology and thermal analysis support; ongoing; unspecified
 - (2) Missing pack/carton detection - microwave spectroscopy support; ongoing; unspecified
 - (3) Rod/filter density detection - spectroscopy support; ongoing; unspecified
 - (4) Optical processing and remote sensing - optics, etc. support; ongoing; unspecified
 - (5) Leaf characterization - microwave spectroscopy and osmometry; ongoing; unspecified
 - c. Tobacco Materials Division (6.5) - RL processing, stem processing; ongoing; unspecified
 - d. Biomaterials Science (6.0) - Develop an alternate tobacco preservative; ongoing; sheet processing plants, primary operations warehouses
 - e. Cigarette Testing (4.0) - Analytical support; ongoing; Manufacturing Services
 - f. Flavor Development (3.2) - Quality; ongoing; Manufacturing, Marketing, Operations
 - g. PED (2.7) - Product evaluation; ongoing; New Product Directorate
 - h. Development Engineering (0.5) - Engineering support; ongoing; unspecified
 - i. Analytical Research (21.3)
 - (1) Characterization of adhesives - Identify and correlate analytical test data with behavior, 1987; systematic study of behavior as a function of formulation, 1988; Manufacturing
 - (2) Materials evaluation - Characterization of materials in use and proposed for use; ongoing; Manufacturing

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- (3) Customer complaints - Identify compounds responsible for customer complaints; as needed; QA
- (4) Effect of storage containers on stored tobacco chemistry - Measure selected components at discrete time periods; 1990; Engineering
- (5) Marlboro Standardization - Analytical support; ongoing; Marlboro Standardization Committee
- (6) Analytical Flavor Specifications - Set specifications for incoming flavors; 1991; QA, Technical Services, Flavor Center
- (7) Leaf Analysis - Analytical support; ongoing; Leaf Department
- (8) Optical Processing - Development of prototype optical processing system; 1988; Manufacturing
- (9) Microscopy - Identify and measure materials from processes or product; as needed; Manufacturing, QA
- j. Tobacco Proc. & Fabr. (11.4) - Semiworks Service; ongoing; requestor

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I. OPTIMIZATION OF RECON

1. Total Personnel - 17.2
2. No. of Divisions involved - 7
3. Goals, Timetables, Customers -
 - a. Tobacco Materials Division (8.3)
 - (1) RL-RCB - Produce Park 500 test sheets representing best pilot candidates using size reformulation; 1987; PM USA Senior Management
 - (2) RL sheet Stability - Determine effect of RL thermal treatment on cell count reductions and subjective changes; 1987; Manufacturing, Park 500
 - b. Biomaterials Science (3.0) - Provide assays for levels and types of microorganisms in process and product; unspecified; Process Development and Sheet Plants
 - c. Cigarette Testing (1.0) - Blend separation, Analytical Support and CI; ongoing; New Product Development, Tobacco Materials Division
 - d. Flavor Development (0.6) - Consumer testing; ongoing; Manufacturing, Marketing
 - e. Analytical Research (2.8) - Analytical support; ongoing; Project 1307
 - f. Tobacco Proc. & Fabr. (1.2) - Semiworks Service; ongoing; requestor

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J. ALTERNATE HUMECTANTS

1. Total Personnel - 8.3
2. No. of Divisions involved - 7
3. Goals, Timetables, Customers -
 - a. Tobacco Materials Division (1.1) - Determine the benefits of humectant redistribution on sheet material based on cigarette factory trials; 1987; PM USA Senior Management
 - b. Development Engineering (0.6) - Engineering Support; ongoing; unspecified
 - c. Biomaterials Science (4.0) - Remove glycols and glycerine from sheet products; 1988; Sheet Processing Plants
 - d. Cigarette Testing (1.0) - Analytical Support; ongoing; New Product Development; Biomaterials Science
 - e. PED (0.5) - Product evaluation; as needed; unspecified
 - f. Analytical Research (0.6) - Analytical Support; as needed; Program Coordinator
 - g. Tobacco Proc. & Fabr. (0.5) - Semiworks Service; ongoing; requestor

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K. BONDED ENDS

1. Total Personnel - 5.6
2. No. of Divisions involved - 2
3. Goals, Timetables, Customers -
 - a. Development Engineering (4.4) - Transfer technology to Manufacturing Engineering; 1987; Manufacturing Engineering
 - b. Tobacco Proc. & Fabr. (1.2) - Semiworks Service; ongoing; requestor

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L. TSNA

1. Total Personnel - 7.6
2. No. of Divisions involved - 2
3. Goals, Timetables, Customers
 - a. Biochemical Research (6.6) - Reduce TSNA in MS smoke by at least 50%; 1992; Director of Research
 - b. Chemical Research (1.0) - Complete theoretical study on nitrosation; 1988; greenhouse support, ongoing; Program Coordinator

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M. LOWERED BIOLOGICAL ACTIVITY

1. Total Personnel - 17.1
2. No. of Divisions involved - 3
3. Goals, Timetables, Customers
 - a. Biochemical Research Division (16.0) - Develop a cigarette with CSC with reduced biological activity (>90%) based on in vitro tests; 1990; Flavor Development
 - b. Analytical Research (1.0) - Analytical Support; ongoing; Program Coordinator

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APPENDIX B
Competitive Profiles

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COMPETITOR PROFILES

The profiles of the various competitors were developed from information found in the public press (trade journals, newsletters, and newspapers, etc.). An attempt was made to keep the information relatively current by using sources generally in the 1982 - 1987 period. It should be understood that the profiles are like a patchwork quilts, in that they are put together from "bits-and-pieces" and some guess work.

R. J. REYNOLDS TOBACCO -U.S.A..

Reynolds' domestic tobacco research and development organization appears to be similar to Philip Morris's. Their 1985 R&D budget is estimated at \$50-\$60 million.

The Bowman Gray Research Center in Winston Salem has been variously reported to have between 500-600 employees. The R&D organization appears to be grouped into the following areas:

- Fundamental R&D

- Applied R&D - technology integrators, trouble shooters

- Branded R&D - marketing dept. identified need

- Agricultural programs

- Process R&D

A recent article in the Winston-Salem Journal (5/5/87) noted that Reynolds was building an \$8.5 million R&D building near the Bowman Gray Tech Center. The expected completion date for the 30,000 square foot facility is 1988. It will be staffed with employees from the "cramped technical center". The entire technical center has 650,000 sq. ft. of lab and office space. Original cost was put at \$56 million. In 1985 700 people worked at the center. The article also indicated that Reynolds was increasing the budget of the tobacco unit, particularly for new product technology.

A 1982 article reported that R.J. Reynolds Tobacco Co. had 15,000 full time employees in - cigarettes, smoking tobacco, chewing tobacco, and little cigars. Since then they have sold off their chewing tobacco, smoking tobacco and little cigar businesses.

According to the same article they have 12 manufacturing facilities and more than 120 warehouses in Winston Salem.

In Lexington Kentucky RJR is reported to have 1 greenleaf stemmery and redrying plant combination and 36 warehouses.

2021554353

Table 2. Estimated Results of RJR Nabisco (dollars in millions)^a

	1985		1986(E)		1987(E)	
	Yr-to-Yr		Yr-to-Yr		Yr-to-Yr	
	Amt(\$)	% Chg	Amt(\$)	% Chg	Amt(\$)	% Chg
Revenues: Tobacco						
Domestic	5,717	4	6,050	6	6,450	7
Foreign	2,345	0	2,840	21	3,125	10
Total Tobacco	8,062	3	8,890	10	9,575	8
Foods and Beverages(b)	8,533	66	10,410	22	11,000	6
Total revenues	16,595	28	19,300	16	20,575	7
Operating income: Tobacco						
Domestic	1,273	16	1,390	9	1,515	9
Foreign	210	2	270	-29	305	13
Total Tobacco	1,483	14	1,660	12	1,820	10
Foods and Beverages(b)	763	97	990	30	1,065	8
Total operating income	2,246	33	2,650	18	2,885	9
Nonoperating income(exp.)						
Corporate expense	-83	12	-115	39	-130	13
Interest expense	-356	90	-570	60	-550	-4
Other income(exp.)	47	-61	60	28	10	-83
Total nonoperating	-392	178	-625	59	-670	7
Pretax earnings	1,854	19	2,025	9	2,215	9
Taxes	853	20	918	8	969	6
Net income	1,001	19	1,107	11	1,246	13
Preferred dividends	91	63	115	26	42	-63
Available for common	910	16	992	9	1,204	21
Earnings per share	3.60	29	3.95	10	4.80	21
Average shares(millions)	252.9	-10	251.0	-1	251.0	0
Operating margins(%)						
Tobacco						
Domestic(E)	22.3		23.0		23.5	
Foreign(E)	9.0		9.5		9.8	
Total Tobacco	18.4		18.7		19.0	
Foods and Beverages	8.9		9.5		9.7	
Total operating margin	13.5		13.7		14.0	
Pretax margin	11.2		10.5		10.8	
Tax rate	46.0		45.3		43.7	
Net margin	6.0		5.7		6.1	

— — Estimated and Recent Quarterly Results — —

1985	1 Qtr	2 Qtr	3 Qtr	4 Qtr
Revenues	2,898.0	3,404.0	4,764.0	5,529.0
Pretax income	347.0	422.0	618.0	580.0
Pretax margin(%)	12.0	12.4	13.0	10.5
Taxes	165.0	194.0	361.0	246.0
Tax rate(%)	47.6	46.0	58.4	42.4
Net income	172.6	228.0	257.0	334.0
Earnings per share	0.66	0.86	0.91	1.17
1986(E)				
Revenues	4,620.0	5,287.0	4,738.0	
Pretax income	371.0	513.0	507.0	
Pretax margin(%)	12.0	9.7	10.7	
Taxes	165.0	237.0	223.0	
Tax rate(%)	47.6	46.2	44.0	
Net income	206.0	276.00	284.00	
Earnings per share	0.66	0.99	1.03	1.42
Yr-to-yr % change	0.0	15.1	13.2	21.4

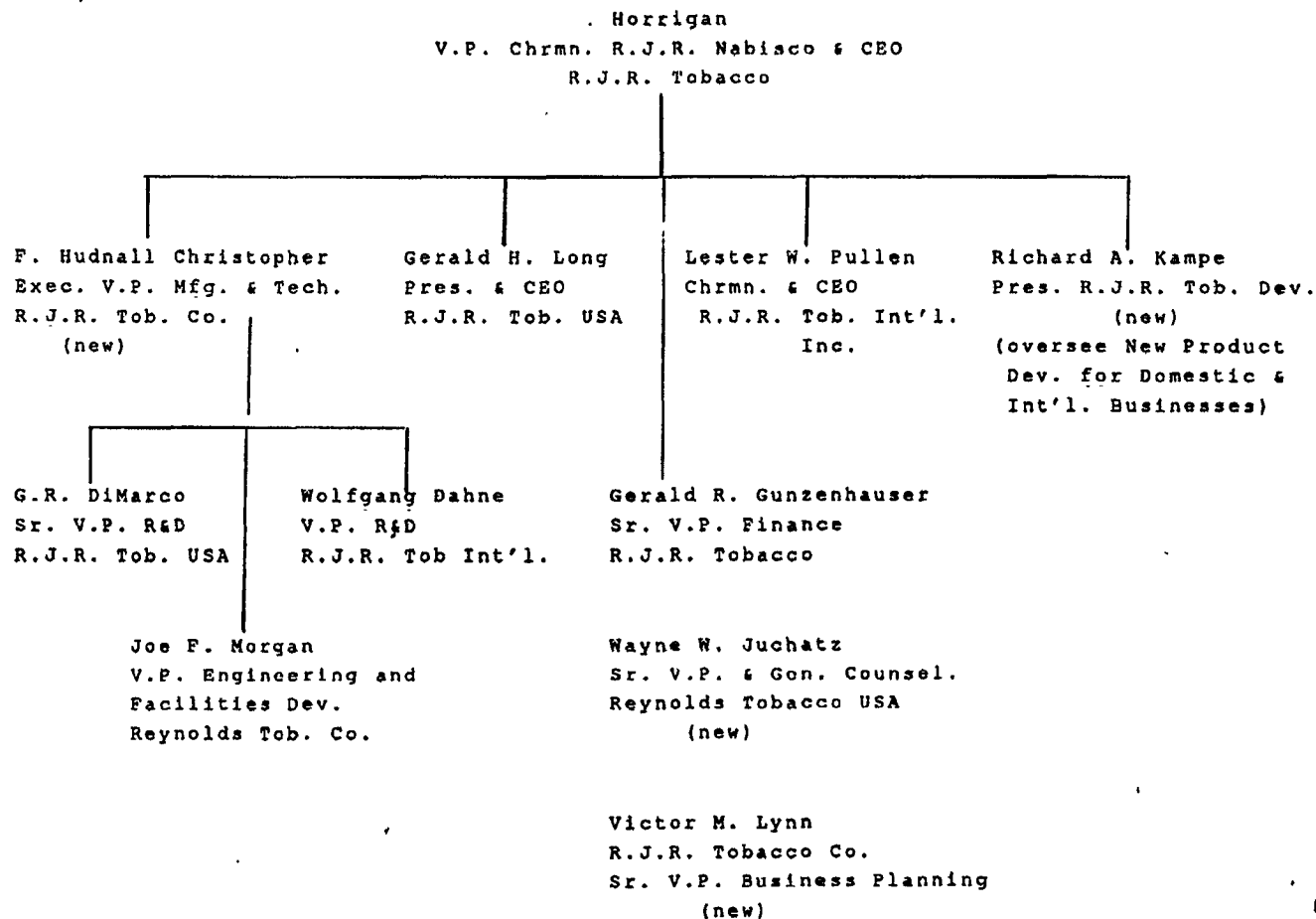
Source: Company's annual and quarterly reports.

(E) Kidder, Peabody & Co. Incorporated estimates.

(a) Except per-share data.

(b) 1986 data reflects full ownership of Nabisco Brands and complete elimination of KFC Corporation.

2021554354



2021554355

Subject: .FLOYD HUDNALL CHRISTOPHER, JR.: A BIOGRAPHY

The following is a complete biography on Floyd H. Christopher, Jr.:

PERSONAL:

REDACTED

EDUCATION:

BSChE, University of Virginia, 1955
MS, Massachusetts Institute of Technology,
1959

MAJOR:

Chemical Engineering

WORK HISTORY:

United States Navy/Lt. Jg., 1955-57
R. J. Reynolds Industries/RJR Archer, Inc./
from plant manager to chief
executive officer, 1959-81
R. J. Reynolds Tobacco Company/senior
vice-president, 1981-83
R. J. Reynolds Tobacco Company/executive
vice-president/manufacturing &
technology, 1983-present
R. J. Reynolds Industries/RJR Archer, Inc./
director, 1979-present
R. J. Reynolds Tobacco Company/director,
1981-present

CONCURRENT
POSITIONS:

United Way Forsyth County/board of directors,
1978-present
Children's Center for the Physically
Handicapped/board of directors
Wake Forest University/board of visitors
Sweet Briar College/board of overseers

MEMBERSHIP:

PRESENT ADDRESS:

REDACTED

Office: R. J. Reynolds Tobacco Company
401 N. Main Street
P. O. Box 2959
Winston-Salem, NC 27102

2021554356

Subject: .G. ROBERT DIMARCO: A BIOGRAPHY

The following is a complete biography on Dr. G. Robert DiMarco from the AMERICAN MEN & WOMEN OF SCIENCE (1986):

PERSONAL: **REDACTED**

EDUCATION: BS, Rutgers University, 1954
PhD, Rutgers University, 1959

MAJOR: Plant pathology

WORK HISTORY: Rutgers University/from assistant professor to professor/food science, 1959-74
General Foods Corporation/director/basic & health science, 1975-77
General Foods Corporation/director/central research, 1977-82
R. J. Reynolds Tobacco Company/from vice-president to senior vice-president/research & development, 1982-present

CONCURRENT POSITIONS: Rutgers University, Cook College/Honorary professor/food science, 1975-present
National Research Council, Military Personnel Supplies/committee member/advisory board, 1978-81
Food Industry Liaison Advisory Panel/AMA, 1978-present

MEMBERSHIPS: **REDACTED**

RESEARCH: Research administration in nutrition; physiology, biochemistry; physical chemistry; engineering; research from very basic to totally applied

PRESENT ADDRESS: R. J. Reynolds Tobacco Company
Technical Center B16
Winston-Salem, NC 27102

2021554357

Subject: .WILLIAM M. HILDEBOLT: A BIOGRAPHY

The following is a complete biography on Dr. William M. Hildebolt from WHO'S WHO IN TECHNOLOGY (1986):

PERSONAL: **REDACTED**

EDUCATION: BS, Ohio State University, 1966
MS, Ohio State University, 1967
PhD, Ohio State University, 1969

WORK HISTORY: Ohio State University/professor/
food technology
Campbell Soup Company/vice-president/
product technology, prior
to 1985
R. J. Reynolds Tobacco Company/vice-
president/research &
development, 1985-present

MEMBERSHIPS: **REDACTED**

RESEARCH: Food science; new products process
development

PRESENT ADDRESS: R. J. Reynolds Tobacco Company
Bowman Gray Technical Center
Reynolds Blvd.
Winston-Salem, NC 27105

Subject: .VICTOR M. LYNN: A BIOGRAPHY

Victor M. Lynn is not listed in any of the standard biographical directories.

According to news releases in March 1987, Victor M. Lynn, 60, joined R. J. Reynolds Tobacco Company as senior vice-president of business planning, a new post. He was previously senior vice-president management representative heading up RJR Nabisco's Heublein business at McCann-Erickson, New York.

Lynn's present address is: R. J. Reynolds Tobacco Company, 401 North Main Street, Winston-Salem, NC 27102.

2021554358

Subject: .WOLFGANG D. DAEHNE: A BIOGRAPHY

Wolfgang D. Daehne is not listed in any of the standard biographical directories.

According to the various tobacco literature, he was named vice-president of research and development at R. J. Reynolds Tobacco Company International, Inc. in 1982 and continues to hold this position.

Daehne joined Reynolds in 1976 as director of leaf/research at R. J. Reynolds Tobacco GmbH in Cologne, West Germany. He was promoted in January 1979 to director of leaf in Europe/Africa/Middle East headquarters in Geneva, Switzerland. He later became vice-president of operations of this headquarters.

His present address is: R. J. Reynolds Tobacco International, Inc., 401 North Main Street, P. O. Box 2959, Winston-Salem, NC 27102.

Subject: .RICHARD A. KAMPE: A BIOGRAPHY

Richard A. Kampe is not listed in any of the standard biographical directories.

According to news releases in March 1987, RJR Nabisco created a third operating unit at R. J. Reynolds Tobacco Company called R. J. Reynolds Tobacco Development Company. This unit is intended to foster better coordination in new product research and development.

Richard A. Kampe, 41, was promoted to head this new unit as president. He was previously executive vice-president of marketing for R. J. Reynolds Tobacco USA.

Subject: .ERNEST S. FARRIER: A BIOGRAPHY

Ernest S. Farrier is not list in any of our standard biographical directories.

A news release in September 1986 stated that Ernest S. Farrier had been advanced to master research and development engineer in the research and development department of R. J. Reynolds Tobacco Company.

Farrier joined Reynolds Tobacco in 1984 as a senior research and development engineer. Before joining Reynolds, he was senior group leader of a technical staff at Union Carbide, the chemical company.

2021554359

Workers at Reynolds center taste, evaluate, analyze cigarettes

The News and Observer, Raleigh, N.C., Sun., Dec. 29, 1985

31A

WINSTON-SALEM (AP) — Water and unsalted crackers stand ready to cleanse the palates of volunteers who will smoke three cigarettes and compare them like fine wines.

Nearby, six smoking machines each puff on 20 cigarettes at a time as the filter pads behind them grow brown with tar.

It's all part of the Bowman Gray Technical Center, the newly expanded, 700-employee, \$56 million research and development facility of the R.J. Reynolds Tobacco Co.

"There are people in the company known for their discriminating palates," Dr. Bill Clapp, planning manager for the facility, said during on a recent tour of the building and its "sensory evaluation" center.

Outside observers aren't allowed to watch the panelists, company employees who volun-

teer for the duty, because they have to concentrate, Clapp said.

Each of the 20 booths in the tasting center — 10 for menthol and 10 for regular — has a little window and a table for the crackers, a cup of water and note paper.

The smoking machines take a two-second puff of 35 cubic centimeters per cigarette per minute, all the way down to a precise 3 millimeters from the butt. While the company maintains that the tar and nicotine collected there and measured have never been proven to cause lung cancer or other diseases, officials say they still have to know the proportions in each type of cigarette.

"We are required by law to put the numbers on each pack, and we want them to be accurate," said company spokeswoman Betsy Annese.

The facility also has a smoking

and health group that is off-limits to visitors. But a company publication about the center says the section provides Reynolds with "information to address smoking and health issues."

"As a manufacturer of tobacco products, Reynolds cannot ignore the continuing, unresolved controversy surrounding smoking and health," it says.

Ms. Annese said the section concentrates not on testing smoking's effects on individuals but rather on gathering and reviewing published materials on it.

Scientists in another section probe the physiological, psychological and behavioral aspects of smoking.

"That's one of those confidential areas," said Ms. Annese. But the Reynolds publication says: "Among the fundamental questions the group is trying to answer are why people smoke, how they

smoke and how smoking behavior is affected by the properties of the smoke."

Reynolds and other tobacco companies maintain cigarettes are not addictive.

There is also an airtight chamber that researchers use to test the effects of smoking on the surrounding environment, Clapp said. A cigarette machine does the smoking while various instruments test the atmosphere inside.

"In back of that room is a one-half of \$1 million mass spectrometer so sensitive that if you just put your hand in front of it, it can tell if you're a smoker," he said.

Researchers and volunteers also analyze competitors' cigarettes, not only for tar and nicotine but also for taste, said Ms. Annese.

Other researchers are looking for ways to control the cigarette

beetle, one of the major pests afflicting tobacco. Much of the information Reynolds gleans is given to agricultural extension departments, Clapp said.

All the information from the various sections is channeled into a large computer room, complete with bins marked "classified waste."

"A lot of what they do is confidential," Ms. Annese said. "It's proprietary — we don't want competitors to get hold of it. Most cigarettes have a recipe all their own."

Company officials also declined to reveal any specific smoking health findings coming from the center, which is secured during off-hours by camera-equipped electronic locks that open only to employees whose face matches the photo on their identification card.

Cigarette foes say one purpose

of the 50 product-liability suits now pending against tobacco companies is to force them to disclose the results of their own research on smoking's effect on health.

"We want to make those documents available. We think they're going to reveal the level of knowledge that companies have — what they actually knew when — and what they did about it," said Richard Daynard, co-chairman of the Tobacco Products Liability Project.

But Reynolds president Gerald H. Long said the lack of growth in the domestic cigarette market was the major impetus behind the research and development center.

"In the years to come, market share growth must come by taking it away from competition," he said when the center was dedicated last month. "The battle for industry leadership is won in the research laboratory."

2021554360

BROWN & WILLIAMSON

SEE THE ATTACHED ADVERTISING AGE PROFILE

Within the past few years B&W has closed its cigarette manufacturing facilities in Louisville, Ky. and Petersburg, Va. and consolidated production at its Macon, Ga. plant. Their R&D budget in 1985 was estimated to be between \$20-\$25 million. In 1984 B&W announced that they would "centralize and expand" their R&D facilities in a vacant Louisville building that formerly housed its world headquarters. A company official said the expanded facilities would be devoted to "scientific research in the tobacco field," especially relating to the development of new brands. The building to be renovated has 300,000 sq. ft. and will be called the Hill Street Technical Research Center. It will house about 400 employees.

2021554361

Table 4. Estimated Results of B.A.T. Industries (pounds in millions)^a

	1985		1986(E)		1987(E)	
	Amt	Yr-to-Yr % Chg	Amt	Yr-to-Yr % Chg	Amt	Yr-to-Yr % Chg
Revenues						
Tobacco	6,154	-11	7400	20	8200	11
Retailing	3,914	-13	3,425	-12	3,400	-1
Paper	1,448	5	1625	12	1650	2
Other	1,180	-26	730	-38	1475	102
Revenues	12,696	-12	13180	4	14725	12
Operating income						
Tobacco	647	-7	690	7	805	17
Retailing	136	-38	165	21	195	18
Paper	156	8	210	35	240	14
Other	49	-47	42	-14	50	19
Financial services	137	10	225	64	270	20
Total operating income	1,125	-12	1332	18	1560	17
Nonoperating income						
Net interest expense	-120	100	-120	0	-98	-18
Associated companies	163	-15	140	-14	160	14
Total	43	-67	20	-53	62	210
Pretax earnings	1,168	-17	1352	16	1622	20
Taxes	431	-19	500	16	594	19
Inc incl minority interest	737	-16	852	16	1028	21
Minority interest	63	-29	60	-5	60	0
Net income	674	-14	792	18	968	22
Earnings per share	45.8	-14	53.5	17	65.0	21
Average shares(millions)	1,472	1	1,480	1	1,490	1
Operating margins(%)						
Tobacco	10.5		9.3		9.8	
Retailing	3.5		4.8		5.7	
Paper	10.8		12.9		14.5	
Other	4.2		5.8		3.4	
Total operating margin	8.9		10.1		10.6	
Pretax margin	9.2		10.3		11.0	
Tax rate	36.9		37.0		36.6	
Net margin	5.3		6.0		6.6	

— Interim Results —

	1985	1st Half	2nd Half
Revenues	10650.0		16062.0
Pre-Tax Income	438.0		730.0
Taxes	174.0		257.0
Tax Rate	39.7		35.2
Net Income	241.0		433.0
Earnings per share	16.37		29.42
1986			
Revenues	14830.0		
Pre-Tax Income	539.0		
Taxes	195.0		
Tax Rate	36.2		
Net Income	323.0		
Earnings per share	21.84		28.16(E)
Year to year percent change	33		-4

Source: Company's annual and quarterly reports.
 Note: All data are currency items unless otherwise indicated.
 (E) Kidder, Peabody & Co. Incorporated estimates.
 (a) Except per-share data.

2021554362

Subject: .EARL EUGENE KOHNHORST: A BIOGRAPHY

The following is a complete biography on Earl Eugene Kohnhorst from the AMERICAN MEN & WOMEN OF SCIENCE (1986):

REDACTED

PERSONAL:

EDUCATION: BChE, University of Louisville, 1970
MChE, University of Louisville, 1971

WORK HISTORY: Brown & Williamson Tobacco Corporation/
process engineer, 1971-76
Brown & Williamson Tobacco Corporation/
manager/development center,
1976-79
Brown & Williamson Tobacco Corporation/
director/manufacturing planning,
1979-80
Brown & Williamson Tobacco Corporation/
director/manufacturing planning
and engineering, 1980-83
Brown & Williamson Tobacco Corporation/
vice-president/research development
& engineering, 1983-present

MEMBERSHIP:

RESEARCH: **REDACTED** Catalytic conversion of nitric oxides using
rare earth catalysts; determining mechanisms
and kinetic rate equations

EMPLOYMENT CLASS: Industry

PRESENT ADDRESS: Office: Brown & Williamson Tobacco
Corporation
P. O. Box 35090
Louisville, KY 40232

REDACTED

2021554363

Subject: .ROBERT ALOIS SANFORD: A BIOGRAPHY

The following is a complete biography on Dr. Robert Alois Sanford from the AMERICAN MEN & WOMEN OF SCIENCE (1986):

PERSONAL:

REDACTED

EDUCATION:

BS, St. Louis University, 1943
PhD, Purdue University, 1949

MAJOR:

Chemical Engineering and Chemistry

WORK HISTORY:

University of Pittsburgh/assistant/
organic chemistry, 1943-44
University of Rochester, Manhattan
Project/research chemist,
1944-46
Sinclair Research Labs, Inc., Catalysis
Research Division/research
chemist, 1948-52
Sinclair Research Labs, Inc., Petroleum
Division/research chemist,
1952-53
Sinclair Research Labs, Inc., Petroleum
Division/group leader, 1953-57
Sinclair Research Labs, Inc., Research
Division/assistant director,
1957-60
Sinclair Research Labs, Inc., Explorer
Division/director, 1960-66
Brown & Williamson Tobacco Company/
director, 1966-79
Brown & Williamson Tobacco Company/
vice-president/research &
development, 1979-83
Brown & Williamson Tobacco Company/
vice-president/science &
technology, 1983-present

RESEARCH: Chemical engineering; heterogeneous catalysis;
petrochemicals; organic chemistry

EMPLOYMENT CLASS: Consulting

PRESENT ADDRESS:

REDACTED

2021554364

B&W Industries			
Lodi, N.Y.			
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LORILLARD

Lorillard is part of Loews Corp. SEE THE ATTACHED ADVERTISING AGE PROFILE. In 1984 Lorillard closed its Louisville plant and consolidated its cigarette manufacturing in Greensboro, N.C. Lorillard's 1985 R&D budget was estimated at \$12-\$15 million. Newport is their leading brand, having replaced Kent in 1985. Lorillard does not have any generic or price/value entries in the market.

2021554366

R: REDACTED MATERIAL

Subject: .ALEXANDER WHITE SPEARS, III: A BIOGRAPHY

The following is a complete biography on Dr. Alexander White Spears, III from AMERICAN MEN & WOMEN OF SCIENCE (1986):

PERSONAL:

REDACTED

EDUCATION:

BS, Allegheny College, 1953
PhD, University Buffalo, 1960

MAJOR:

Chemistry

WORK HISTORY:

University of Buffalo/research associate
chemist, 1956-58
Millard Fillmore College/instructor,
1958-59
P. Lorillard Company, Research Division/
research associate, 1959-61
P. Lorillard Company, Research Division/
senior research chemist, 1961-65
P. Lorillard Company/director/basic
research, 1965-68
P. Lorillard Company/vice-president/
research & development, 1971-75
P. Lorillard Company/senior vice-president/
research & development, 1975-77
Lorillard Corporation/executive vice-
president/operations & research,
1977-present

MEMBERSHIPS:

REDACTED

HONORS & AWARDS:

Distinguished Achievement Award in Tobacco
Science/Philip Morris Inc., 1970

RESEARCH:

Cancer chemotherapy; pyrolytic reactions
and products; spectroscopy; chromatography

EMPLOYMENT CLASS:

Industry

PRESENT ADDRESS:

Lorillard Corporation
420 English Street
Greensboro, NC 27405

2021554367

R: REDACTED MATERIAL

Subject: .FREDERICK JOHN SCHULTZ: A BIOGRAPHY

The following is a complete biography on Dr. Frederick John Schultz from the AMERICAN MEN & WOMEN OF SCIENCE (1986):

PERSONAL:

REDACTED

EDUCATION:

BA, Augustana College Illinois, 1952
MA, DePauw University, 1956
PhD, University of Iowa, 1960

MAJOR:

Chemistry

WORK HISTORY:

Lorillard, Inc./research chemist,
1959-62
Lorillard, Inc./senior research chemist,
1962-65
Lorillard, Inc./product development
manager, 1965-68
Lorillard, Inc., Research Division/
manager/research, 1968-75
Lorillard, Inc., Research Division/
director, 1975-78
Lorillard, Inc./vice-president/research
& development, 1978-present

MEMBERSHIPS:

REDACTED

RESEARCH:

Composition of tobacco and tobacco smoke;
relation of composition to biological
activity and organoleptic properties;
selective filtration of tobacco smoke;
analytical methods development; new
products in areas of tobacco and food
products

EMPLOYMENT CLASS:

Industry

PRESENT ADDRESS:

Lorillard Research Center
P. O. Box 21688
Greensboro, NC 27420

2021554368

Loews Corp.		1935-1936		1936-1937	
New York		1935-1936		1936-1937	
Wendell	1936	1937	% chg	Wendell	1937
Revenue	4,320	5,200	20.4	Revenue	5,200
Operating	3,500	4,200	20.0	Operating	4,200
Net income	157	180	14.6	Net income	180
Dividend	100	100	0.0	Dividend	100
Assets	1,500	1,500	0.0	Assets	1,500
Liabilities	1,500	1,500	0.0	Liabilities	1,500
Equity	1,500	1,500	0.0	Equity	1,500
Employees	1,500	1,500	0.0	Employees	1,500
Properties	1,500	1,500	0.0	Properties	1,500
Real estate	1,500	1,500	0.0	Real estate	1,500
Investments	1,500	1,500	0.0	Investments	1,500

Loews Corp. sold its most profitable subsidiaries—movie theater—and slashed spending in measured media advertising for its client brands as it relied on growth and big returns to come from Lorillard, its client unit, and the second most advertised division, CNA Financial Corp.

Lorillard, after dropping 4% in sales in 1935, reported a 10% increase in 1936. However, its net income increased 12.3% to \$137.1 million in 1935 following a 15% increase the previous year.

Lorillard, in the seven media months by Leading National Advertisers, cut measured media advertising 17.8% on its client brands in 1935 and saw 19% of the total client market decline. By July 1936, it had 14.7% of the market, up from 14.4% in 1935. The company credits its decline largely to the increase in sales of generic and proprietary cigarette markets in which Lorillard has no entries.

Among full-priced cigarettes, Lorillard increased its market share from 8.4% to 8.5%. Lorillard contributes 22.4% of Loews' total revenue.

Newport, Lorillard's leading brand, nudged into the top 10 domestic sellers of 21 cigarettes in 1935, edging out Larkin, its former leading brand. Lorillard's 1935 cigarette sales were 23% from 1934, according to LNA. Newport cigarettes were backed with about \$20.5 million in measured advertising—more than half of that in outdoor advertising.

Lorillard rolled out a new brand, True Gold, in 1935, in three low-end, unlabeled offerings. Danter Filmmaking, New York, agency for the new brand, reported that sales were more than \$6 million to advertise the new brand out of a total expenditure of \$11 million for the True line. Spending on the line has been declining steadily the past three years. True measured revenue in 1935 was 10% off the 1934 level, while 1936 was 13.7% less than in 1935.

Next leading the \$14.4 million in measured media up from \$14.6 million in 1934, but still far below \$21.5 million in 1933. Next came a Golden Light 100's package in 1935. As a result of Kent's declining sales, Lorillard underwent an agency review for the Kent family in 1935, choosing BBDO, New York, to replace Potts, Cohn & Beeding, New York.

Loews' second arm, CNA Financial Corp., which made up 71% of Loews' revenue and 46% of its net income in 1935, reported a 41.5% increase in revenue in the property-casualty division. That increase came on the heels of a 17% rise reported in 1934. Net income in the unit soared 219% to \$223.5 million. The life insurance sector of the CNA business, however, experienced a 25% decline in net income to \$43.3 million.

The company attributes its growth

in the insurance business to the dramatic turnaround in the property-casualty unit. In 1935, the unit's net income was \$14.4 million, up from \$14.6 million in 1934. The unit's net income was \$14.4 million in 1934, up from \$14.6 million in 1933. The unit's net income was \$14.4 million in 1934, up from \$14.6 million in 1933.

Bulova Watch Co. posted net income of \$167 million, up from \$3.1 million in 1934 and a loss in 1933. Bulova introduced Ultime, a line of 14. Karve Gold and 101-carat diamond watches, in 1935 and expanded its production of 101-carat watches. The company's net income was \$167 million in 1935, up from \$3.1 million in 1934 and a loss in 1933. The company's net income was \$167 million in 1935, up from \$3.1 million in 1934 and a loss in 1933.

group headed by A. J. Jernard Pershing, S. J. Jernard, and J. J. Jernard. The group's net income was \$167 million in 1935, up from \$3.1 million in 1934 and a loss in 1933. The group's net income was \$167 million in 1935, up from \$3.1 million in 1934 and a loss in 1933.

ADVERTISING EXPENDITURES

(In thousands)

Loews Corp.	1935	1936
Operating	1,500	1,500
Net income	157	180
Dividend	100	100
Assets	1,500	1,500
Liabilities	1,500	1,500
Equity	1,500	1,500
Employees	1,500	1,500
Properties	1,500	1,500
Real estate	1,500	1,500
Investments	1,500	1,500

Loews Corp.

New York, N.Y., 19100

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AMERICAN TOBACCO

SEE PROFILE FROM ADVERTISING AGE

American Tobacco is part of American Brands, a large diverse corporation with holdings in sporting goods (golf equipment), distilled spirits (Jim Beam, Cutty Sark), soap and toiletries, and food (Sunshine Biscuits) to mention just a few.

In 1985 American moved its administrative center to Chesterfield County, Va. A total of about 75 of the NY based employees relocated. A \$10 million renovation and construction project was reportedly part of the move. The report mentioned renovation of the 100,500 sq. ft. R&D center and the addition of a 39,840 sq. ft. annex.

In 1986 American announced that all cigarette manufacturing would be done at their Reidsville, N.C. facility. They closed the stemmery in Richmond, Va., indicating that this work would be contracted in the future. Cigarette manufacturing in Richmond was discontinued in 1981.

Also in 1986, American moved their marketing and headquarters operation from N.Y.C. to Stamford, Conn.

American's R&D budget for 1985 was estimated at \$10-12 million.

In 1985 Virginius B. Lougee, III was appointed Chairman and CEO, and Thomas C. Hays President and CO, both of Am. Tobacco Co. Lougee is a graduate of NC State. Hays, who continues as VP of Am. Brands, graduated from Calif. Inst. of Tech. He also has a MBA from Harvard. Lougee recently announced that he will retire at the end of 1987. He will be succeeded by William J. Alley, 57 the company's vice chairman.

Dallas O. Pinion was made Assistant Research Mgr. of the R&D department in 1987. He joined the company in 1968.

American's brands include the Lucky Strike line, Carlton, Pall Mall and Tareyton (charcoal).

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Table 3. Estimated Results of American Brands, Inc. (dollars in millions)^a

	1985		1986(E)		1987(E)	
	Amt(\$)	Yr-to-Yr % Chg	Amt(\$)	Yr-to-Yr % Chg	Amt(\$)	Yr-to-Yr % Chg
Revenues						
Tobacco						
Domestic	1,450.0	3	1,530.0	6	1,600.0	5
International	2,940.0	4	3,625.0	23	3,975.0	10
Total tobacco	4,390.0	4	5,155.0	17	5,575.0	8
Non-Tobacco	2,918.3	44	3,325.0	14	3,600.0	8
Total revenues	7,308.3	17	8,480.0	16	9,175.0	8
Operating income						
Tobacco Products						
Domestic	408.2	7	455.0	11	480.0	5
International	111.4	-3	155.0	39	170.0	10
Total tobacco	519.6	5	610.0	17	650.0	7
Non-Tobacco	204.5	-8	215.0	5	230.0	7
Total operating income	724.2	1	825.0	14	880.0	7
Financial service income	174.1	1	176.0	1	180.0	2
Nonoperating income						
Corporate expense	-28.7	10	-30.0	5	-34.0	13
Interest expense	-116.9	-1	-109.0	-7	-101.0	-7
Other income(exp.)	-2.0	NM	7.0	NM	2.0	-71
Total nonoperating income	-147.6	1	-132.0	-11	-133.0	1
Pretax earnings	750.7	1	869.0	16	927.0	7
Taxes	329.9	-1	388.0	18	391.0	1
Net income	420.9	2	481.0	14	536.0	11
Preferred dividends	16.7	-5	15.0	-10	14.0	-7
Net income available	404.2	2	466.0	15	522.0	12
Earnings per share						
Primary	3.67	2	4.24	16	4.83	14
Fully-diluted	3.59	2	4.20	17	4.80	14
Average shares(millions)	110.2	0	109.9	0	108.0	-2
Operating margins(%)						
Tobacco Products						
Domestic	28.2		29.7		30.0	
International	3.8		4.3		4.3	
Total operating margin	11.8		11.8		11.7	
Nonoperating margin	7.0		6.5		6.4	
Total operating margin	9.9		9.7		9.6	
Pretax margin	10.3		10.2		10.1	
Tax rate	43.9		44.6		42.2	
Net margin	5.8		5.7		5.8	

— — Estimated and Recent Quarterly Results — —

	1 Qtr	2 Qtr	3 Qtr	4 Qtr
1985				
Revenues	1,731.6	1,626.3	2,012.9	1,938
Pretax income	191.6	164.3	206.3	189
Pretax margin(%)	11.1	10.1	10.3	10
Taxes	83.6	78.4	91.9	76
Tax rate(%)	43.7	47.7	44.5	40
Net income	107.9	85.9	114.4	113
Earnings per share	0.92	0.73	0.98	0.99
1986(E)				
Revenues	2,111.5	1,937.1	2,223.8	
Pretax income	199.5	188.7	67.8	
Pretax margin(%)	11.1	9.7	3.1	
Taxes	85.1	91.1	36.2	
Tax rate(%)	43.7	48.3	53.4	
Net income	114.4	97.6	31.6	
Earnings per share	0.99	0.85	1.25	0.97
Yr-to-yr % change	7.1	17.2	27.6	-3

Source: Company's annual and quarterly reports.

Note: All data are dollar items unless otherwise noted.

NM Not meaningful.

(E) Kidder, Peabody & Co. Incorporated estimates.

(a) Except per-share data.

2021554371

Subject: .ROBERT SHIELDS SPRINKLE, III: A BIOGRAPHY

The following is a complete biography on Robert Shields Sprinkle, III from the AMERICAN MEN & WOMEN OF SCIENCE (1986):

PERSONAL:

REDACTED

EDUCATION:

BS, Emory and Henry College, 1957

WORK HISTORY:

American Tobacco Company/chemist,
1957-63
American Tobacco Company/manager/
product development, 1963-65
American Tobacco Company/supervisor/
new products division, 1965-68
American Tobacco Company/coordinator/
research & development, 1968-76
American Tobacco Company/deputy director/
research & development, 1976-78
American Tobacco Company/director/
research & development, 1978-80
American Tobacco Company/vice-president/
research & development, 1980-present

MEMBERSHIP:

RESEARCH:

Chemistry and composition of tobacco and tobacco smoke; pyrolytic products of combustion; applications of radioactive assay techniques for identification of particulates and gas phase constituents of tobacco smoke; spectroscopy; gas and liquid phase chromatography

EMPLOYMENT CLASS:

Industry

PRESENT ADDRESS:

Office: American Tobacco Company
Research & Development Department
P. O. Box 899
Hopewell, VA 23860

REDACTED

2021554372

Subject: .PRESTON HILDEBRAND LEAKE: A BIOGRAPHY

The following is a complete biography on Dr. Preston Hildebrand Leake from the AMERICAN MEN & WOMEN OF SCIENCE (1986):

PERSONAL:

REDACTED

EDUCATION:

BS, University of Virginia, 1950
MA, Duke University, 1953
PhD, Duke University, 1954

MAJOR:

Chemistry

WORK HISTORY:

Allied Chemical Corporation, Nitrogen
Division/research supervisor/
organic chemistry, 1954-60
Albemarle Paper Manufacturing Company/
assistant research director,
1960-65
American Tobacco Company/assistant to
managing director/research &
development, 1965-68
American Tobacco Company/assistant
managing director, 1968-70
American Tobacco Company/assistant
director/research & development
department, 1970-present

MEMBERSHIPS:

REDACTED

RESEARCH:

Polycyclic aromatic chemistry; psychorr
synthesis; amino acids and cyanuric acid
derivatives; polyethylene; sizing; silica
fume; specialty and filter papers; tobacco

EMPLOYMENT CLASS:

Industry

PRESENT ADDRESS:

American Tobacco Company
Research & Development Department
P. O. Box 899
Hopewell, VA 23860

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LIGGETT

Liggett Group, Inc. formerly Liggett & Meyers Tobacco Co. became a division of Grand Metropolitan Ltd., another large conglomerate. In 1986 GrandMet sold Liggett to Bennett S. LeBow, a N.Y. based investor. The purchase price was reported to be \$137 million. LeBow has no previous experience in the tobacco industry. Liggett, the smallest of the major U.S. cigarette manufacturers, has in recent years relied mainly on business in the generic and private label sectors.

Robert E. Gillis, a partner of LeBow, will become chairman of Liggett Group Inc. and K.v.R. Dey will remain president and CEO.

In 1987 Liggett announced layoffs of more than 100 hourly manufacturing employees, saying the cutbacks were necessary because of reduced cigarette sales.

2021554376

Subject: .ROBERT LEE KERSEY, JR.: A BIOGRAPHY

The following is a complete biography on Robert Lee Kersey, Jr. from the AMERICAN MEN & WOMEN OF SCIENCE (1986):

PERSONAL:

REDACTED

EDUCATION: BS, University of Richmond, 1948

WORK HISTORY: Standard Oil Company of Indiana/
assistant project chemist,
1948-53
Liggett & Myers Tobacco Company/
chemist, 1953-65
Liggett & Myers Tobacco Company/
special assistant to director
of research, 1965-70
Liggett & Myers Tobacco Company/
manager/product development,
1970-75
Liggett & Myers Tobacco Company/
director/research, 1975-78
Liggett & Myers Tobacco Company/
vice-president, 1978-present
Liggett & Myers Tobacco Company/
chief research officer, 1981-
present

MEMBERSHIPS:

REDACTED

RESEARCH: Tobacco and tobacco products research
and development

EMPLOYMENT CLASS: Industry

PRESENT ADDRESS: Liggett & Myers Inc.
Research Department
West Main Street
Durham, NC 27702

2021554377

MAJOR U.S. TOBACCO PRODUCTS MANUFACTURERS

Cigarettes

The American Tobacco Company, (Subsidiary of American Brands, Inc.), Executive Offices: Six Stamford Forum, P.O. Box 10380, Stamford, Connecticut 06904-2380. Telephone: 203-325-4900. Telex: 643-874. Personnel: Thomas C. Hays, president and chief executive officer; Cleveland C. Kern Jr., senior vice president-operations; Charles H. Mullen, senior vice president-sales; William J. Moore, vice president-advertising; Richard H. Morrison, vice president-manufacturing and leaf; Robert S. Sprinkle, III, vice president-research and development; James H. Wells, vice president-field sales; Vivian A. Parks, Jr., vice president and controller; Dudley L. Baverly, Jr., treasurer; Robert M. Bousie, leaf purchases director, Durham, N.C.; Gerard K. Colley, purchasing director, Richmond, Va.; John H. Hager, leaf services director, Richmond, Va. Plant locations: Petügre and Blackwell Streets, Durham, N.C. 27701-3624. John W. Tucker, manager. Telephone: 919-682-2101. N. Scales Street, Reidsville, N.C. 27320-2906. L.M. Tilley, manager. Telephone: 919-349-6261. 2009 East Grace Street, Richmond, Va. 23223-7062. W.E. Gates, Jr., manager. Telephone: 804-643-2821. Principal cigarette brands: Pall Mall, Lucky Strike, Tareyton, Carlton, Silva Thins.

Brown & Williamson Tobacco Corp., Executive offices: 1500 Brown & Williamson Tower, Louisville Galleria, P.O. Box 35090, Louisville, Kentucky 40232. Telephone: 502-568-7000. Telex: 204115. Cable: BROWNSON LVL. Personnel: R.J. Pritchard, chairman and chief executive officer; T.E. Sandifer, Jr., president and chief operating officer; W.L. DeWitt, senior vice president; B.M. Lonsdale, senior vice president-human resources; E. Pepples, senior vice president and general counsel; C.J. Hegor, senior vice president, finance; T.E. Whitaker, vice president-corporate marketing; C.J. Dunn, consultant; J.S. Helms, vice president-corporate communications; H.A. Roeder, vice president-manufacturing and leaf processing; R.H. Sachs, vice president-law and deputy general counsel; E.E. Kohnhorst, vice president research development and engineering. Plant locations: 600 N. Chestnut Street, Winston-Salem, North Carolina 27102. E.T. Perrack, Jr., vice president and general manager. Telephone: 919-722-5125. 2600 Weaver Road, Macon, Georgia 31202. R.G. Watkins, branch manager. Telephone: 912-743-0561. Leaf processing plant: C/O Export Leaf Tobacco Company, Old Stantonburg Road, Wilson, North Carolina 27853. C.M. Gibbs, branch manager. Telephone: 919-291-4700. Products: cigarettes, smoking tobacco, pipe tobacco, chewing tobacco, snuff. Principal cigarette brands: Barclay, Beizer, Kool, Raleigh, Richland, Viceroy.

G.A. Georgopulo & Co., Inc., 48 Stone St., New York, New York 10004. Telephone: 212-425-7048. Telex: 226238. Cable: GEORGOPO. Products: cigarettes and small cigars, importers of cigarettes and tobacco products. Principal brand: Rameses II, Turkish Special, Andron.

Larus & Brother Co., Inc., House of Edgeworth, 5721 South Laburnum Ave., Richmond, Virginia 23231. Telephone: 804-222-3990. Cable: EDGEWORTH. Personnel: W. Brooks George, chairman of the board; R.S. Pless, president and chief executive officer; H.B. Robelen, secretary-treasurer. Manufacturers, importers, distributors. Principal brands: Rothmans; pipe tobacco — Edgeworth, Holiday.

Liggett Group Inc., Liggett & Myers Tobacco Co., Main & Fuller Streets, Durham, North Carolina 27702. Telephone: 919-683-9000. Telex: 575407. Personnel: K.V. Dey, Jr., president and chief executive officer; Josiah S. Murray, vice president, general counsel and secretary; David M. Walsh, vice president, finance; James C. Turner, vice president, product assurance & operations; Harold A. Grant, vice president, sales & marketing; Donald E. Mott, vice president, personnel & employee relations; Robert L. Kersey, Jr., vice president, research. Products: cigarettes. Principal brands: L & M, Chesterfield, Lark, Eve, Generics/private labels.

Lorillard, Executive Offices: (Attn. S. Ridgway) 666 Fifth Ave., New York, New York 10103. Telephone: 212-841-8500. Personnel: J. Robert Ave, president, chief executive officer; Alexander W. Spears, executive vice president-operations & research; Richard H. Orcutt, senior vice president-sales; David R. Tedder, senior vice president, leaf & support services; Arthur J. Stevens, senior vice president-general counsel; M. Alfred Peterson, senior vice president-finance; Joseph P. Mastandrea, vice president-sales; Lou Gordon, vice president-trade development; Sara R. Ridgway, vice president-public relations; Louis E. Burch, director-leaf purchasing; Thomas H. Mau, senior vice president, advertising and brand management; Roger P. Edwards, vice president, manufacturing. Operations center: 2525 East Market St., Greensboro, N.C. 27401 — A.W. Spears, executive vice president-operations and research; Dewey R. Tedder, senior vice president-leaf and support services; Fred J. Schultz, vice president research and development; Roger B. Edwards, vice president-manufacturing. Louis E. Burch, director-leaf purchasing. Plant locations: 2525 East Market St., Greensboro, N.C. — Major Bowles, general manager; 3029 Muhammad Ali Blvd., (Mail Box 1018), Louisville, Ky. 40212 — Gene Rains, general manager; Old Halifax Road, (Mail Box 3200), Danville, Va. 24541 — Lawrence W. Armons,

general manager. Products: cigarettes, cigars, chewing tobacco. Principal brands: (Cigarettes) Kent Filter, Kent Filter Box, Kent Filter 100s, Kent III Filter, Kent Filter 100s (Menthol), Kent III 100s, Kent III Box 100s, Kent Golden Lights Filter, Kent Golden Lights Filter (Menthol), Kent Golden Lights Filter 100s, Kent Golden Lights 100's (Menthol), Newport Filter (Menthol), Newport Lights Filter (Menthol), Newport Filter Box (Menthol), True Filter, True Filter (Menthol), True Gold Filter Box, Kings & 100s, Satin Filter, Satin Filter (Menthol), Triumph Filter, Triumph Filter (Menthol), Old Gold Filter, Old Gold Lights Filter, Old Gold Straight, Spring Filter (Menthol), Max Filter, Max Filter (Menthol), (All Filter) Kent Golden Lights Box 80s, Kent Golden Lights Box 100s, Newport 100s, Newport Box 100s, Newport Lights 100s, Newport Lights Box 80s, Newport Lights Box 100s, Newport 25s, Newport 25s & 100s.

Luckett Tobaccos Inc., 222 So. First St., Suite 304, Louisville, Kentucky 40202-1257. Telephone: (502) 562-9283. Telex: 204153. Personnel: William R. Mayer, president. Plant location: Compagnie Des Tabacs Comme Il Faut, P.O. Box 787, Port au Prince, Haiti. Category of business: wholesale exporter.

Park Avenue Tobacco, Inc., 1000 Jefferson Davis Highway, Richmond, Virginia 23224. Telephone: (804) 233-8108. Telex: 9103805282. Personnel: James Dond, president and CEO; Roy Jorstad, executive vice president, marketing; Larry Sargent, director of marketing. (Associated with Roemtsma International GmbH, Ludwig West Germany). Products: cigarettes. Principal brands: West, Astor, Delta, 1776, Knightsbridge.

Philip Morris Companies Inc., Executive Offices: 120 Park Ave., New York, New York 10017. Telephone: 212-880-5000. Telex: 212 878-2995. Personnel: James M. McNeill, chairman of the board and chief executive officer; John A. Murphy, president; Hugh Culman, vice chairman of the board; R. William Murray, vice chairman of the board; James L. Ferguson, vice chairman of the board; Frank E. Petrak, vice president-Philip Morris Inc.; president and chief executive officer-Philip Morris U.S.A.; Philip L. Smith, vice chairman of the board; Thomas R. Arantes, senior vice president and general counsel; Stanley S. Scott, vice president, director of corporate affairs; Eugene J.T. Flanagan, vice president, secretary and associate general counsel; William K. Howell, president and chief executive officer-Carlisle Brewing Co.; Ehud Hounimer, senior vice president, planning; William I. Campbell, vice president-Philip Morris Inc.; executive vice president-marketing-Philip Morris U.S.A.; Geoffrey C. Bibb, president and chief executive officer-Philip Morris International; William J. O'Connor, senior vice president, administration and human resources; George R. Lewis, vice president and treasurer; Philip J. Reilly, president and chief executive officer-Mission Viejo Beach Group Inc.; Carlos E. Salguero, vice president-Philip Morris Inc.; executive vice president-Philip Morris International; R. Nelson Baane, vice president and controller-Philip Morris Companies Inc.; Richard L. Snyder, vice president-Philip Morris Inc.; executive vice president-Philip Morris International; Hans G. Stern, senior vice president, chief financial officer-Philip Morris Companies Inc.; Alexander H. Homan, associate general counsel; vice president and general counsel-Philip Morris U.S.A.; Bruce S. Brown, staff vice president and director, legal-Philip Morris Companies Inc.; Gene A. Knorr, staff vice president, Washington relations-Philip Morris Companies Inc.; F. Robert Kurimsky, staff vice president, information and communications services-Philip Morris Companies Inc.; William C. Smy, staff vice president and general auditor-Philip Morris Companies Inc.; William K. Transue, staff vice president, personnel-Philip Morris Companies Inc.; Mark A. Serrano, vice president-Philip Morris Inc.; executive vice president, operations-Philip Morris U.S.A.; James T. Broadlove, assistant secretary, Philip Morris Companies Inc. Philip Morris U.S.A. Executive offices and officers listed above with the following additions: Fred J. Lutz, senior vice president, personnel; Albert J. Bissmeyer III, vice president, business development; W. John Campbell, senior vice president, plant operations; Vincent J. Succatolo, vice president, sales; O. Wither Dudley, vice president, leaf; John J. Davis, senior vice president, trade development; Dr. Kenneth S. Houghton, vice president, research and development; Harry G. Steele, vice president, finance and administration; Guy L. Smith, IV, vice president, corporate affairs; George W.B. Taylor, vice president, engineering; James L. Thompson, Jr., vice president, manufacturing; Porzosa P. Jones, controller; David Dangoor, vice president, brand/promoters; Edwin J. McQuigg, vice president-sales development; Lawrence W. Zinski, vice president-field sales. Philip Morris International. Executive offices and officers listed above with the following additions: John E. Kramer, Jr., director of finance and treasurer; Frank T. Toscano, controller; Elizabeth Bulson, vice president marketing services; Alvaro G. Buzzi, president, EEC; Dinyar Desai, president, PM Asia; Marc Goldberg, executive vice president LA/1; Richard A. Hutchinson, Jr., senior vice president LA/1; Thomas M. Kearns, vice president, finance; Lee Pollak, vice president; Bernard Beaupere, vice president, personnel; Walter Thoma, president, EEMA; William H. Webb, managing director, PM Australia; Andrew Whist, vice president, corporate affairs; Martin D.J. Buss, vice president, international planning. Factory Locations: Richmond Mfg. Center-3501 Commerce Road (Mail: P.O. Box 26603), Richmond, Va. 23234. Telephone: 804-274-2000. Personnel: W. John Campbell, senior vice president, plant operations; Ronald A. Lively, general manager, manufacturing, Richmond, Louisville Plant-1930 Maple Street (Mail: P.O. Box 1498), Louisville, Ky. 40201. Telephone: 502-566-1234. Personnel: William R. Moore, general manager, manufacturing—Louisville. Cabarrus Plant-3321 Highway 29 South (Mail: Box 1093), Concord, N.C. 28025. Telephone: 704-788-5000. Personnel: Newton O. Foster, general manager Cabarrus operations. Research & Development Center-4201 Commerce Road, Richmond, Va. 23234. Personnel: Dr. Kenneth S. Houghton, vice president; research and development; Dr. Thomas S. Osdone, Director, science and technology. Products: cigarettes. Principal brands: Marlboro, Merit, Benson & Hedges 100's, Virginia Slims, Parliament Lights, Cam-

bridge, Players, Saratoga, Philip Morris Commander, English Ovals.

R.J. Reynolds Tobacco Co., Subsidiary of RJR Nabisco, Inc., Has 2 Operating Units, R.J. Reynolds Tobacco USA and R.J. Reynolds Tobacco International, 401 North Main St., Winston-Salem, North Carolina 27102. Telephone: 919-777-5000. Telex: 806-483. Cable: use Winston-Salem Address. Personnel: E.A. Horigan, Jr., chairman and CEO-R.J. Reynolds Tobacco Co.; G.H. Long, president and CEO-R.J. Reynolds Tobacco USA; F.H. Christopher, executive vice president, manufacturing and technology-R.J. Reynolds Tobacco Co.; R.A. Emken, executive vice president-R.J. Reynolds Tobacco USA; R. Angiolini, president, R.J. Reynolds Tobacco USA-sales and distribution; R.B. Beasley, vice president, field sales-R.J. Reynolds Tobacco USA; R.E. Clements, vice president, leaf buying-R.J. Reynolds Tobacco USA; G. Robert O'Marco, senior vice president, research and development-R.J. Reynolds Tobacco USA; J.B. Dempster, vice president, materials management-R.J. Reynolds Tobacco USA; Y.W. Ford, Jr., vice president, field sales-R.J. Reynolds Tobacco USA; J.J. Gangloff, vice president finance and chief financial officer-R.J. Reynolds Tobacco USA; L.W. Hall, Jr., vice president, marketing development-R.J. Reynolds Tobacco USA; R.A. Kampe, president-R.J. Reynolds Tobacco Development Co.; Clyde W. Fitzgerald, senior executive vice president-R.J. Reynolds Tobacco USA; C.E. Snyder, vice president, production-R.J. Reynolds Tobacco USA; J.R. Trulove, vice president, distribution-R.J. Reynolds Tobacco USA; Victor M. Lynn, senior vice president-business planning-R.J. Reynolds Tobacco Co.; Joe F. Morgan, vice president-engineering and facilities development-R.J. Reynolds Tobacco Co.; Wayne W. Juchatz, senior vice president and general counsel-R.J. Reynolds Tobacco Co.; David B. Fisher, vice president, public relations; W. Eugene Answorth, Jr., vice president, government relations-R.J. Reynolds Tobacco USA; M.E. Butcher, assistant manager, leaf processing and storage division-R.J. Reynolds Tobacco USA; Marvin R. Martin, vice president, information resources-R.J. Reynolds Tobacco USA; W.G. Entos, Jr., director, purchasing-R.J. Reynolds Tobacco USA; J.T. Wnebrener, senior vice president, marketing-R.J. Reynolds Tobacco USA; D.K. Isbister, vice president, manufacturing-R.J. Reynolds Tobacco USA; T.J. Sullivan, vice president, trade relations-R.J. Reynolds Tobacco USA; K.J. Kelsor, group director, purchasing-R.J. Reynolds Tobacco USA; W.W. Kibler, Jr., group personnel director, operations-R.J. Reynolds Tobacco USA; W.E. Moffitt, personnel director, production/quality assurance-R.J. Reynolds Tobacco USA; D.P. Montgomery, vice president manufacturing engineering-R.J. Reynolds Tobacco USA; E.N. Monahan, vice president, planning-R.J. Reynolds Tobacco USA; R.L. Morgan, director, quality assurance-R.J. Reynolds Tobacco USA; G.T. Baroddy, group director, marketing services-R.J. Reynolds Tobacco USA; Tom Ogburn, director, public relations-R.J. Reynolds Tobacco USA; R.R. Gordon, Jr., vice president, personnel; W.M. Hildebolt, vice president, research and development-R.J. Reynolds Tobacco USA; G.W. McKenna, vice president-marketing planning-R.J. Reynolds Tobacco USA. Products: Reynolds Tobacco USA manufactures more than 50 brands in the U.S. in one major tobacco product classification: cigarettes. Cigarettes: Bright 100s (menthol), Camel (Regular (non-filter), Camel Filters, Camel Filters Hard Pack, Camel Lights, Camel Lights Hard Pack, Camel Lights 100s, Century Filters, Century Filters 100s, Century Lights, & Century Lights 100s, Century Lights Menthol 100s, Doral Filter, Doral 100s, Doral Menthol, Doral 100s Menthol, Doral Ultra Lights 100s, Doral Full Flavor 85s, Doral Full Flavor 100s, More, More Menthol, More Lights 100s (box), More Lights 100s Menthol (box), Now Filter, Now Box, Now Menthol, Now 100s Filter, Now Filter 100s Box, Now 100s Menthol, Ritz 100s (box), Ritz 100s Menthol (box), Salem, Salem 100s (menthol), Salem Lights (menthol), Salem Lights 100s (menthol), Salem Ultra (menthol), Salem Ultra 100s (menthol), Salem Slim Lights 100s (menthol; box), Salem Lights 100s (box), Vantage Filter, Vantage Menthol, Vantage 100s, Vantage 100s Menthol, Vantage Ultra Lights, Vantage Ultra Lights 100s, Winston, Winston Box, Winston 100s, Winston Lights, Winston Lights 100s, Winston Ultra Lights, Winston Ultra Lights 100s, Winston Lights 100s box, Winston Lights box. R.J. Reynolds Tobacco International, Inc. the international operating unit of R.J. Reynolds Tob. Co., a subsidiary of RJR Nabisco, Inc., Reynolds Plaza Complex, 401 North Main St., P.O. Box 2959, Winston-Salem, N.C. 27102. Telephone: 919-777-5000. Telex: 806483 RJRTIL WSL. Cable: REYNOLDS WINSTON-SALEM. Personnel: Lester W. Pullen, chairman and chief executive officer; Lester W. Pullen, chairman and CEO; Dale F. Sisal, president; Klaus D. Langner, executive vice president; Locke M. Newlin, executive vice president; Edward J. Lang, executive vice president; Howard M. Barwell, vice president, marketing; Wolfgang D. Dahne, vice president, research & development; H. Gene Wick, vice president, operations; Charles H. Jennings, senior vice president, human resources; Richard J. Marcolullo, vice president, public affairs; Japp Uttenboogaard, vice president and chief financial officer; Peter J. Van Every, vice president general counsel and secretary. Headquarters and plants worldwide: R.J. Reynolds Tobacco International, S.A., 12-14 Chemin Fleu, 1211 Geneva 17, Switzerland; R.J. Reynolds Tobacco GmbH, Maria-Ablatz Platz 15, P.O. Box 100 685, D-5000 Cologne 1, West Germany; Berlin plant, 12-21 Waldestrasse, P.O. Box 22, D-1000 Berlin 51, Germany; Trier plant, Diederhofener Strasse, Industriegebiet Monaise, P.O. Box 4080, D-5500 Trier, West Germany; N.V.R.J. Reynolds Tobacco/Gossel S.A., 6 rue Gabrielle Petit, Straat 6, Bruxelles 1020, Belgium; R.J. Reynolds Tobacco France S.A. 171, avenue Charles de Gaulle, 92521 Neuilly-sur-Seine Cedex, France; R.J. Reynolds Tobacco Espana, S.A., Oficina de Representación para Espana, Marques de Villamagna 6-8, 28001 Madrid, Spain; Canary Islands plant, R.J. Reynolds Tobacco Company, S.A.E., El Paso, Island of La Palma, Canary Islands, Spain; R.J. Reynolds (Portugal)-Empresa Comercial de Tabacos Lda, rua dos Soeiros no. 338-4-Esq., 1500 Lisbon, Portugal; R.J. Reynolds Tobacco (Hellas) A.E.B.E., 2-4 Mesogion Ave., Athens Tower "A", 5th Floor, Athens 11527, Greece; R.J. Reynolds Tobacco B.V., Vreelandseweg 46, 1216 CH, Hilversum, The Netherlands; RJR Nabisco

Cigarette Manufacturers

Divisione Tabacchi S.p.A., Via Correggio 19, 20149 Milano, Italy; R.J. Reynolds Tobacco A.B., Kanalvaegen 15, S-183 30 TAEBY, Sweden; R.J. Reynolds Tobacco AG Dagmersellen, CH-6252 Dagmersellen/LU, Switzerland; R.J. Reynolds Tobacco Int'l (U.K. office), Del Monte House, 240 London Road, Staines, Middlesex TW18 4JD, United Kingdom; RJR-Macdonald Inc., One First Canadian Place, Toronto, Ontario, Canada M5X 1E8; Montreal plant, 2455 Ontario Street East, Montreal, Quebec, Canada H2K 1W3; Tillsburg leaf processing, P.O. Box 310, No. 3 Highway West, Tillsburg, Ontario, Canada N4G 4H8; R.J. Reynolds Tobacco Co., Puerto Rico, De Diego Expressway, Buchanan Exit State Road 165, GPO Box 3509, San Juan, Puerto Rico 00936; Puerto Rico plant, Highway 3 KM 90.4, Box 368, Yabucoa, Puerto Rico 00767-0070; R.J. Reynolds Tabacos do Brasil Ltd., Praia de Botafogo 228, 13th Floor, Caixa Postal 62570, 22257 Rio de Janeiro, Brazil; Santa Cruz do Sul plant, Rua Assis Brasil 983, Caixa Postal 390, 96800 Santa Cruz do Sul, Rio Grande do Sul, Brazil; Santa Cruz do Sul leaf processing, BR 471, Distrito Industrial de Da. Carlota, 96800 Santa Cruz do Sul, Rio Grande do Sul, Brazil; Fabrica de Cigarillos El Progreso S.A., Amazonas 3123 Via Azuay, Casilla 17, Otalo, Ecuador; Guayaquil leaf processing, Fabrica de Cigarillos El Progreso, S.A., Casilla 193 Guayaquil, Ecuador; R.J. Reynolds Tobacco Co. (H.K.), Ltd., 7th & 25th Floors, Sun Hung Kai Centre, 30 Harbour Road, Wanchai Hong Kong. R.J. Reynolds Tobacco Co. Sdn. Bhd., Bangunan British-American, Jalan Semantan, Damansara Heights, P.O. Box 11056, Kuala Lumpur, Malaysia; Kuala Lumpur plant, Persiaran Raja Muda, P.O. Box 37, Shah Alam Industrial Estate, Selangor, Malaysia; R.J. Reynolds Tobacco Australia, Inc., Northport, Suite 2401, Level 24, 100 Miller Street, P.O. Box 1325, North Sydney, NSW 2060, Australia; R.J. Reynolds/M.C. Tobacco Co., Minami Aoyama 22, Daijyo Bldg., 3rd Floor, 3-6 Minami Aoyama 7-Chome, Minato-Ku, Tokyo 107, Japan. R.J. Reynolds Tobacco International (Asia/Pacific), Inc., c/o Thong Huat Importers & Exporters Pte. Ltd., Suites 1207-1209, 12th Floor, Shenton House, Shenton Way, Singapore 0106, Singapore; R.J. Reynolds Tobacco International, Inc., c/o Bordello Consolidated Inc., P.O. Box 3237, Agaña, Guam 96910. Xiamen Cigarette Factory, 18 Hu Yuan Road, Xiamen, People's Republic of China. RJR Nabisco China, Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong. Products: cigarettes, cigars, smoking tobacco.

Nat Sherman Company, 711 Fifth Ave., New York, New York 10022. Telephone: 212-751-9100. Personnel: Nat Sherman, chief operations officer; Ron Filmore, director of operations. Plant address: 629 W. 54th St., New York, N.Y. 10019. Telephone: 212-582-0278/9. Manufacturers, importers, distributors. Principal brands: Nat Sherman, Cigarettes, Cigarettes Lights, Cigarettes Filter King, Cigarettes Filter Queen, MCD, MCD Lights, Natural Filter, Natural Lights, Slims, Slim Lights, Clova, Mint, Virginia Circles, Virginia Circles Filter, Virginia Circles Lights, Havana Ovals, Havana Rounds Filter, Havana Rounds Lights, Turkish Ovals, Turkish Rounds Filter, Turkish Rounds Lights, Phantom Filter, Jubilee Lights-Gold Filter Tips, Casinos, Cigarettes Long Filter Tipped, MCD Double Filter Tipped, Fantasia Gold Filter Tipped, Casinos "333" Filter Tipped, #164 Non-Filter.

Tobacco Exporters International (USA) Ltd., 2280 Mountain Industrial Boulevard, Tucker, Georgia 30034. Telephone: 404-493-1469. Telex: 261394 TEIAUR. Cable: EDGEWORTH ATL Importers and distributors of cigarettes. Principal brands: Dunhill, Craven "A", Rothmans, St. Moritz.

West Park Tobacco, Inc., 1100 Jefferson Davis Highway, Richmond, Virginia 23224. Telephone: 804-233-5300. Telex: 510100 3438 (WESTPARK RIC). Personnel: Peter Kortemeyer, president. (Associated with Reemtsma International GmbH, Hamburg, West Germany). Products: cigarettes. Principal brands: West, Delta, 1776, Knightsbridge, Astor.

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AMERICAN BRANDS INC
131-334 4505282 *W/P/Premixer Wrap For Smoking Articles*
Paper Sheet And Carton Packages Coated With Calcium Citrate
219-121 4507535 *Method And Apparatus For Perfuming Material*

BRITISH AMERICAN TOBACCO CO LTD GB
131-110 4553555 *Cigarette Using Material*
242-58 4553712 *Feeding Wire Material*
403-42 4525161 *Method For Producing Tobacco Smoke Filters*

BROWN & WILLIAMSON TOBACCO CORP
118-654 4487276 *Apparatus And Method For Applying, Packaging To Fibrous Filler Material And Device For Manufacturing A Mouthpiece And Attaching Mouthpieces To Cigarette Tobacco Columns*
296 4528594 *Tobacco Treating Process*
297 4536073 *Process For Reduction Of Nicotine Content Of Tobacco By Microbial Treatment*
4557280 *Process For Reduction Of Nicotine And Nicotine Content Of Tobacco By Microbial Treatment*
302 4484556 *Pneumatic Conveying Tobacco Drying Apparatus*
304 4517832 *Tobacco Conditioning Apparatus Sealed Pneumatic Tobacco Conveying And Treating Apparatus*
335 4484331 *Cigarette Filter*
4458488 *Cigarette Filter*
4503289 *Cigarette Mouthpiece*
4505623 *Ventilated Mouthpiece For A Smoking Article*
4515170 *Ventilated Mouthpiece For A Smoking Article*
4527572 *Tobacco Smoke Filters*
4531753 *Smoking Article Filters*
4540065 *Cigarette Having A Mouthpiece*
45-2754 *Filtered Cigarette*
4545381 *Cigarette Filter*
4550740 *Mouthpiece For A Cigarette And A Cigarette Having Same*
4557281 *Filtered Cigarette*
339 4517856 *Ventilated Filter And Smoke Drawing Mouthpiece*
156-500 4517046 *W/P/Device For Making Grooves In Cigarette Filters*
4533427 *W/P/Device For Making Grooves In Cigarette Filters*
553 451-4249 *W/P/Device For Making Grooves In Cigarette Filters*
4547253 *W/P/Device For Making Grooves In Cigarette Filters*
414-459 4515518 *Towable, Hydraulically Powered Lifting And Transport Trailer*
425-384 4535149 *Apparatus For Making Grooves In Cigarette Filters*
403-41 4514180 *Method Of Making Filter For A Cigarette Product*

JAPAN TOBACCO & SALT PUBLIC CORP JP
131-222 4588072 *Cigarette Packaging Apparatus*
188-416 4552821 *Cigarette Packaging Apparatus*
414-330 4557698 *Apparatus For Supplying Cigarettes*
412 4524839 *Method And Apparatus For Unwrapping A Box Packed With Compressed Material*

PHILIP MORRIS INC
73-38 4517825 *Salt-Cleaning Process*
101-565 4498390 *Method And Apparatus For Embossing Fol*
131-75 4534367 *Roll-Your-Own Cigarette Maker*
70 4522214 *Method And Apparatus For Constructing A Cigarette Filter To Produce A Cigarette Rod With Predetermined Moisture Content*
84 4535719 *Tobacco Rod Forming Means*
4482238 *Method And Apparatus For Production Of Smoke Filter Components*
4535730 *Method And Apparatus For Aligning Oval Cigarette Filters*
276 4506337 *W/P/Smoking Compositions/Alkylcarbazole Ester Flavorant*
4536627 *W/P/Smoking Compositions Containing A Beta Hydroxy Gamma Alkoxy Ester Flavorant*
277 4532844 *W/P/Smoking Compositions Containing A Desirable Ester Flavorant/Alkylcarbazole Ester Flavorant*
4536628 *W/P/Smoking Compositions Containing A Desirable Ester Flavorant/Alkylcarbazole Ester Flavorant*
4540004 *W/P/Smoking Compositions Containing A Flavorant/Alkylcarbazole Ester Flavorant*
278 4535731 *W/P/Smoking Compositions Containing A Flavorant/Alkylcarbazole Ester Flavorant*
4561451 *W/P/Smoking Compositions Containing A Flavorant/Alkylcarbazole Ester Flavorant*
281 32013 *Smoking Tobacco*
32014 *Process For Expanding Tobacco*

4497330 *Process For Increasing The Filling Power Of Tobacco*
4532845 *W/P/Process For Increasing And Maintaining The Filling Power Of Tobacco/Treating With A Conditioning Agent And An Expansion Agent And Having Same*
360 4498448 *Tobacco Bulk Shaken System*
357 4532846 *Method And Apparatus For Tipping Tobacco Leaves Packed Upon Bales*
331 4518589 *W/P/Non-Combustible Carbonized Cigarette Filter/Non-Combustible Or Alkali Metal Salt And Cigarette*
338 4528183 *Filter Cigarette*
4527373 *Filter Cigarette*
4532843 *Cigarette Having A Concocted Wrapper*
4535558 *W/P/Alkali-Cured Bright Tobacco Filter, Brands And Smoking Articles/Flavor, Characteristic Acid*
353 4510390 *W/P/Flavor, Extracted, Tobacco-Containing Smoking Article And Method Of Making Same*
369 4506684 *W/P/Modified Catalytic Smoking Material And Method For Its Preparation/Preparation Of Metal Salts*
219-121 4499381 *Laser Beam Interrupter And Detector*
4499382 *Rotary Beam Chopper With Continuously Variable Duty Cycle*
313-312 4498714 *Overhead Retail Merchandising Unit For Cigarettes*
350-255 4506682 *Lane Markers*
488 4519680 *Beam Chopper For Producing Multiple Beams*
425-465 4484853 *Heated Die For Galvanizing Material*
536-18 4547568 *W/P/Co-Polymer/Phenyl-Guanidinyloxy Guanidinyloxy And Related Compounds/Flavoring Flavor Upon Smoking*

REYNOLDS & J TOBACCO CO
29-235 4551887 *Smoking Remover*
34-242 4507876 *End Seal For Rotary Treating Drum*
53-542 4539715 *Orientation, Accumulation And Positioning Machine*
73-38 4495786 *Apparatus And Method For Measuring Permeability Of A Moving Web*
48 4538836 *Package Leak Tester*
83-408 4522086 *Drying Apparatus For Sheet Material*
118-234 4508452 *Application Of Liquid Additives To Cigarette Filter Tow*
131-34 4516585 *Method And Apparatus For Producing A Multiple-Blend Cigarette*
290 4524983 *Process For Producing Metal Sheet*
271 4531520 *Process For Increasing Filling Capacity Of Tobacco*
295 4554822 *Pressure Vessel And Method Of Using Same*
352 4545592 *W/P/Tobacco Product*
359 4534371 *W/P/Smoking Product/Heat Treated Vegetable With Tobacco-Like Brown Color*
4534372 *W/P/Smoking Product/Tobacco Leaves Coated With Tobacco Carved Green To Impart A Brown Color*

365 4561454 *Smoking Article Having Reduced Seamsheet Smoke*
198-347 4502587 *Automatic Accumulator For Rectangular Articles*
236-44 4540118 *Variable Air Volume Air Conditioning System*
427-177 4525385 *W/P/Injection Of Additives To Cigarette Filter Tow/Spraying Or Injecting Two Gas Flow*
403-42 4537583 *Method And Apparatus For Conveying Filter Tow*
49 4548875 *Manufacture Of Tobacco Smoke Filters*

ROTHMANS OF PALL MALL CANADA LTD CA
131-109 4557278 *Tobacco Laminar And Sheet Processing*
304 4512353 *Tobacco Drying Procedure*

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AMERICAN BRANDS INC
131-336 4616654 Tobacco Product

BRITISH AMERICAN TOBACCO CO LTD GB

131-284 4583558 JP/Marking Of Smoking Article Wrappings
304 4583559 Reordering Of Tobacco
332 4624268 JM/Smoking Articles/Less Smokes
365 4607647 JM/Smoking Articles/Stain Resistant Paper Wrapping
222-55 4591073 Apparatus For Monitoring Particulate Material
364-552 4599699 Cigarette Manufacturing Machines
406-108 4582455 Pneumatic Transporters
435-126 4585737 Preparation Of Oxygenated Ambroxides
493-43 4601686 Production Of Tobacco-Smoke Filters
45 4578053 Tobacco-Smoke Filters

BROWN & WILLIAMSON TOBACCO CORP

83-60 4622875 System And Process For Sorting And Opening Packages
131-296 4630619 Process For Treating Tobacco
297 4566468 Process And System For Making A Blended Tobacco Product
303 4582070 Tobacco Treating Process
336 4580564 Cigarette Filter
4582072 Cigarette Filter
4606999 Cigarette Filter
4611607 Cigarette Filter
4617946 Tobacco Smoke Mouthpiece And Method Of Making Same
4620557 Cigarette Having A Mouthpiece And Method Of Making Same
339 4585015 Cigarette Filter
221-199 4583657 Adapter For A Package Dispensing Machine

JAPAN TOBACCO & SALT PUBLIC CORP THE JP

34-31 4587743 Method Of Controlling Temperature Of Drying Machine
46 4578878 Tobacco Drying Machine
53-529 4631904 Apparatus For Compressing Cigarettes
575 4616475 Package Forming Apparatus
74-57 4592244 Device For Reciprocally Driving A Shaft
131-94 4574817 Cork Knife Cleaning Apparatus
4619277 Tobacco Filter Tip Attaching Apparatus
297 4605016 JP/Process For Preparing Tobacco Flavoring Formulations/Cold Water Extraction Of Leaves Mixed With Glycerol
317 4566471 Cutting Apparatus
198-399 4630724 Method And Device For Forming A Row Of Filter-Tip Cigarettes
241-30 4627577 Flow Control System In Shredding Machine
37 4632318 Knife Feed System In Rotary Drum Cutter
384-13 4571011 Oil Sealing Bearing For Axially Reciprocating Shaft
493-49 4575368 Method And Apparatus For Making Filters
164 4581004 Paper Pressing Device For An Arbor Turret Packaging Machine
568-384 4605764 JP/Process For Converting Inactive-Type Stereoisomers In Synthesized Stereocoin Into Active-Type Stereoisomer/Chromatography, Racemization, Epimerization

JAPAN TOBACCO INC JP

131-108 4607645 Shredded Tobacco Supplying Device For Cigarette Making Machine
336 4583560 Tobacco Smoke Filter
198-419 4614263 Cigarette Arranging Apparatus
493-84 4605390 Packing Container Forming Apparatus

PHILIP MORRIS INC

53-148 4571917 Apparatus For Packing Oval Cigarettes
131-79 4619276 JP/P/Tobacco Processing/Applying Liquid Foam To Tobacco
64 4567502 Tobacco Trimmer Device
4593705 Sinter Knife Advance Unit And Method Of Use
94 4552257 Method And Apparatus For Tipping Smoking Articles
275 RE32055 JC/P/Cooled Flavors For Smoking Products/Cigarettes
276 4592373 Smoking Compositions/Meterocycl-Hydroxy Substituted Carboxylic Acid Derivative As Flavor Additive
260 4555027 Rod Weight Control For A Cigarette Making Machine
291 4574219 JM/P/Process For Increasing The Filling Power Of Tobacco/Spraying With Supersaturated Calcium Chloride Solution
297 4559426 JP/Tobacco Treatment/Removal Of Potassium Nitrate From An Aqueous Extract And Replacing With A Potassium Salt Nontoxic Process For Modifying The Flavor Characteristics Of Bright Tobacco
308 4555469 JP/Process For Dissimulatory Denatification Of Tobacco Materials/Incubation, Microorganisms, Vacuum
309 4537645 JP/Process For Modifying The Smoke Flavor Characteristics Of Tobacco/Pressurized Heating With Ammonia
336 4570549 Filter Cigarette
4600027 Cigarette And Method Of Making It
4521259 Filter Cigarette
355 4625737 Foamed, Extruded, Tobacco-Containing Smoking Article And Method Of Making The Same
4532151 Foamed, Extruded, Coherent Multistrand Smoking Articles
361 4565016 Expanded Web Of Sheet Material And Method Of Making Same
355 4574821 Expanded Wrapper And Smoking Articles Including Same
206-251 4582081 Folding Carton And Blank Therefor, For Cigarettes
263 4570790 Folding Carton And Blank Therefor, For Cigarettes
267 4585625 Cigarette Pack
414-766 4592658 Process For Removing Covering Material From Tobacco Bales
493-381 4582507 Apparatus For Manufacturing An Expanded Web Of Sheet Material And A Composite Expanded Web
544-357 4520024 JC/P/Polyheterocyclic Compounds/Pyrazine And Or Pyridine Derivatives, Smoking Flavorants
405 4556513 JC/P-Pyrazinyl-1-Propanone Derivatives Useful As Flavorants In Smoking Compositions
546-281 4590278 JC/Nicotine Analogs/Cocaine, Insecticides
549-379 4576455 JC/Smoking Compositions Containing A Dicarboxylate Ester Flavorant-Release Additive/Dioxane
560-60 4607118 JC/Flavor-Release Beta-Hydroxy-Ester Compositions/Pyrolysis Products For Flavor And Aroma
562-577 4612391 JP/Preparation Of Oxycarboxylic Acids

REYNOLDS, R J TOBACCO CO

53-377 4612752 Carton Flap Folding Assembly For Cigarette Cartons
131-77 4555024 Segmented Cigarette
327 4597396 Farmer's Bale Delaminator
4628348 System, Apparatus, And Method For Preparing A Quantity Of Tobacco For Primary Processing
336 4576187 Variable Air Duction Cigarette Filter
359 4596259 Smoking Material And Method For Its Preparation
211-153 4603782 Adjustable Shelf Assembly
235-44 4627568 Moisture Eliminator For Air Washer
356-439 4589775 Apparatus And Method For Accumulating And Measuring Sidestream Smoke Produced By A Smoking Material

ROTHMANS OF PALL MALL CANADA LTD CA

131-109 4627447 Tobacco Winnowing Method And Apparatus
300 4567903 Formation Of Tobacco Material Blend
312 4565470 Tobacco Leaf Processing

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	R.J.R			LORILLARD			J.T.S.			B. & W		
	84	85	86	84	85	86	84	85	86	84	85	86
CHEMICAL analytical synthesis			1				2	2	3			
ALKALOIDS			2				1	1	2			
TOBACCO CHEM.	1	2					1	1				
SMOKE chem. odor/taste			1				5	6	4			
FIRE SAFETY						1						
PSYCHOLOGICAL RESPONSES			1									
BIOLOGICAL ACTIVITY					1		3	13	14			
BIO-TECH			2				2	17	10			
FILTRATION				1			1					
PROCESSING								3			1	
PRODUCT TESTING	2											
	2	2	7	1	1	1	15	43	33		1	

Source: "Comp Database," Charity McDonald .(600/700 systems
do sys:database comp.)

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PATENTS ASSIGNED TO MAJOR CIGARETTE PRODUCERS

LEGEND: tobacco patents (class 131)/total patents issued

<u>COMPANY</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>	<u>1980</u>
B&W	20/28	10/12	6/7	12/16	7/9	4/6
RJR	8/20	2/6	2/4	1/5	2/8	0/2
PM	26/35	14/21	14/19	18/33	19/25	7/21

OTHER COMPANIES LISTED UNDER CLASS 131- TOBACCO PATENTS INCLUDED:
HAUNI, MOLINS GD AND IFF IN ADDITION TO THOSE LISTED ABOVE

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PHILIP MORRIS, INC.'S
NORTH AMERICAN TOBACCO COMPANY COMPETITORS
AND THEIR SUBSIDIARIES

AMERICAN BRANDS INC. (formerly American Tobacco Co.)

<u>Subsidiary</u>	<u>Product/Service</u>
ABCO Inc.	solid waste incineration
Acme Visible Records, Inc. -	storage and retrieval systems
Achushnet Co. -	TITLEIST golf balls, other golf products and equipment, PINNACLE products, FOOT-JOY, Inc. - golf shoes, gloves street shoes and footwear for other sports
Beam (James B.) Distilling -	JIM BEAM bourbon whiskey BEAM'S CHOICE bourbon whiskey NATIONAL DISTILLERS AND CHEMICAL CO.
*Buckingham Corp. -	importers of CUTTY SARK scotch
Case (W.R.) & Sons Cutlery	
Franklin Life Insurance -	individual insurance policies - life, home, auto, etc.
Gallaher - a tobacco unit -	B&H SPECIAL FILTER SILK CUT OLD HOLBORN
Golden Belt Manufacturing Co. -	foil laminating operation
Jergens (Andrew) -	JERGENS soaps and lotions; GEE, YOUR HAIR SMELLS TERRIFIC shampoo and conditioner, BARBIE toiletries for children, NATURE SCENTS soap, WOODBURY soap
Marvel Lighting Co. -	incandescent and fluorescent lamps
Master Lock Co.	
National Distillers and Chemical Corp.	
MCM Products Inc. -	cutlery, electrical and incandescent lights, office and auto repair products
Pinkerton's Inc. -	security service

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Southland Life Insurance Co. - group and individual insurance policies -
life, health and disability

Sunshine Biscuits - cookies and crackers -
CHEEZITS,
HI HO,
KRISPY,
HIDROX

Swingline - staplers, fastening tools, chemical
adhesives, specialty items for the
automotive industry and industrial
fastening devices

Wilson Jones Co. - business books

2021554385

BROWN & WILLIAMSON INDUSTRIES (formerly Brown & Williamson Tobacco Corp.)

<u>Subsidiary</u>	<u>Product/Service</u>
Aleutian King Crab -	largest processor of Alaskan crab meat
*Gimbels -	department stores
*Kohl Corp. -	a supermarket, drugstore, bakery, department store, liquor and thrift store chain in Wisconsin and Illinois
Saks-Fifth Avenue -	department stores
Sea Pass -	frozen seafood plant
*Vita Foods -	packer and importer of gourmet foods including caviar, sardines, kosher foods, maraschino cherries.

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IMASCO LTD. (formerly Imperial Tobacco Co. of Canada)

<u>Subsidiary</u>	<u>Product/Service</u>
Burger Chef	-
Fast Food Merchandiser's Inc.	
Hardees	
Imperial Tobacco Products -	cigarettes and cigars - DuMAUIER PLAYERS
Koffler Stores -	drugstores and drycleaning outlets
People's Drug Stores	
*Progresso -	PROGRESSO frozen and canned foods
Shopper's Drug Mart -	Canadian based drugstore chain

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*LIGGETT GROUP, INC. (formerly a division of Grand Metropolitan Ltd.)

<u>Subsidiary</u>	<u>Product/Service</u>
Allen Products -	ALPO dog food, biscuit snacks for dogs - LIV-A-SNAPS, BEEF-SNAPS, CHICK-N-SNAPS
*Austin-Nichols -	importer, bottler, rectifier and distributor of alcoholic beverages - WILD TURKEY bourbon whiskey, GRANT'S Scotch whiskey, METAXA Greek brandy, CAMPARI Italian aperitif, and others
*Brite Industries, Inc. -	watchbands
Carillon Importers, Ltd. -	import GRAND MARNIER, BOMBAY gin, BOMBAY vermouth and a variety of wines, brandies and cordials
Earl Grissmer -	BLUE LUSTRE household cleaning products - carpet shampoo, furniture polish, upholstery cleaner, vacuum cleaner bags, glass cleaner
Eilebrecht Zigaretten -	W. German cigarettes and cigars
Leach Industries, Inc. -	wholesale liquor distributor
Mercury Mills -	prepackaged room-sized rugs sold in major retail stores
*National Oats, Inc. -	packaged cereals - CREAM OF OATS, INSTANT CREAM OF OATS, 3 MINUTE CEREALS, 3 MINUTE POPCORN, CORNCO animal foods
Paddington Corp. -	exclusive importer of J&B scotch whiskey
Pepsi-Cola Bottling Co. Inc.	
Western Dairy Products -	importer and producer of dairy products

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LORILLARD CORPORATION (formerly Lorillard Co.) now a division of Loew's
Theatres, Inc.

<u>Subsidiary</u>	<u>Product/Service</u>
Golden Nuggett Candy Co. -	LOOK candy bars, BIG HUNK candy bars (distributed primarily west of Mississippi)
*Reed Candy Co. -	REED hard candy
*Schenley Industries, Inc. -	ANCIENT AGE, I.W. HARPER, SCHENLEY RESERVE, DEWAR'S WHITE LABEL scotch

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RJR NABISCO (formerly R.J. Reynolds Industries Inc.)

<u>Subsidiary</u>	<u>Product/Service</u>
Archer Inc. -	aluminum foil and packaging -
Artistic Manufacturing Corp. -	ribbons, bows, gift wrap and foil
*Bear Creek Corp. -	mail-order sales of fruit, gourmet food and garden plants through HARRY & DAVID and JACKSON & PERKIN'S catalogs
Del Monte Corp. -	DEL MONTE fruits, juices, and vegetables, *CANADA DRY ginger ale, club soda and mixers, MORTON'S frozen foods, BRER RABBIT molasses, MY-T-FINE pudding, COLLEGE INN broth, DAVIS baking powder, VERMONT MAID syrup, PATIO Mexican food, ORTEGA foods, CHUN KING Oriental foods
Filler Products, Inc. -	snack foods - KORN KURLS
*Filmco, Inc. -	vinyl packaging films used to wrap meats and produce in grocery stores
Fresher Cooker, Inc. - (renamed Cooker Concepts Inc.)	fast food restaurant chain located in Florida featuring non-fried light menus
*Heublein -	A-1 steak sauce, ALMADEN VINEYARDS GREY POUPON mustard, alcoholic beverages including: SMIRNOFF'S vodka, JOSE CUERVO tequila, INGLENOK wines, NAPPA VALLEY wineries, DON Q rum, BLACK VELVET CANADIAN whiskey, POPOV vodka, RELSKA vodkas, LANCERS wines, HARVEYS BRISTOL CREAM sherry, HEUBLEIN cocktails, VALBON French table wines
*Kentucky Fried Chicken	
Nabisco Brands, Inc. -	OREO cookies,

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NILLA WAFERS,
HONEY MAID graham crackers,
PREMIUM saltines,
PLANTERS nuts,
ALMOST HOME cookies,
CHIPS AHOY! cookies,
NUTTER BUTTER peanut butter cookies
SHREDDED WHEAT cereal,
many other cookies, crackers, and
cereals
HOME HEARTH bread mixes,

Pacific Hawaiian Products Co. - HAWAIIAN PUNCH beverages

Skolniks Bagel and Bakery Restaurants

*Sunkist Soft Drinks, Inc. - SUNKIST beverages

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U.S. TOBACCO CO.

<u>Subsidiary</u>	<u>Product/service</u>
Bon-Vin, Inc. -	distributor of expensive wines -
Circus Foods, Inc. -	CIRCUS canned nut products and candy bars
Lummis & Co. -	canned and packaged nuts, peanut butter
Mastercraft Pipes -	imported pipes and specialty smoking articles
National Pencil Co.	
National Tobacco Co. Ltd.	
Ste. Michelle Vintners -	STE. MICHELLE premium brand wines, generic brand wines, grape and berry wines, dessert wines - port and sherry, POMMERELLE wines, GRANADA wines, HADASSIM koshered wines HERZYL koshered wines
Tuckersharpe Pen Co. -	writing instruments and desk sets
W.H. Snyder and Sons, Inc. -	HOUSE OF WINDSOR cigars, MARK IV cigars, BAHAI cigars and other brands

* See attached page for corporate transactions

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CORPORATE TRANSACTIONS

Buckingham Corp. was sold to BEATRICE FOODS

Gimbels was sold to ALLIED STORES CORP.

Kohl Corp. was sold to GREAT ATLANTIC & PACIFIC TEA CO., INC.

Vita Foods was sold to DEAN FOODS INC.

Progresso was sold to OGDEN CORP.

Liggett Group, Inc. was sold to LE BOW INDUSTRIES INC.

Austin-Nichols was sold to PERNOD RICARD OF PARIS

Brite Industries, Inc. was sold to GARSTAN INC.

National Oats, Inc. was sold to CURTICE-BURNS INC.

Reed Candy Co. was sold to LAURA SECORD CO.

Schenley Industries, Inc. was sold to RAPID-AMERICAN CORP.

Bear Creek Corp. was sold to SHAKLEE CORP.

Canada Dry was sold to CADBURY SCHWEPPES P.L.C.

Filmco, Inc. was sold to ENVIRODYNE INDUSTRIES INC.

Heublin was sold to GRAND METROPOLITAN P.L.C.

Kentucky Fried Chicken was sold to PEPSICO INC.

Sunkist Soft Drinks, Inc. was sold to CADBURY SCHWEPPES P.L.C.

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APPENDIX C

**Analysis of Current Societal and
Governmental Influences on the Cigarette
Industry of Importance to R&D**

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PHILIP MORRIS U. S. A.

I N T E R - O F F I C E C O R R E S P O N D E N C E

Richmond, Virginia

To: .Strategic Planning Committee Date: May 27, 1987
From: .R. N. Ferguson and M. Waugh
Subject: .Social-Political Context of Cigarette Sales and Use in the U.S. -
1987

PERSONAL &
CONFIDENTIAL

The major resource for our input to you on the challenges facing our industry was Mr. Jack Nelson, New York Office of P.M., who provided us with much of the information on which the following sections are based.

At this point in time there appear to be five major issue areas facing the cigarette industry. These areas, listed below, will each be discussed in following sections.

1. Social acceptability and the increased restrictions which are accompanying decreased acceptability
2. Product liability
3. Cigarette taxation
4. Advertising and promotion issues
5. Self-extinguishing cigarette

1. Social Acceptability

Almost all cigarette useage occurs in a social context, so that the degree of acceptability of smoking to others becomes the major issue from which pressures on the individual smoker ultimately originate. A product used in a social context can become unacceptable if it violates social mores or if it entails a level of risk intolerable to others.

There is convincing evidence that the public perception of risk in general has heightened, due perhaps to major changes in the structure of society - weakened religion, health crazes, ageing population, etc. Whatever the root causes, smoking is now perceived as a health risk to non-smokers. The following Roper data undoubtedly underestimates the state of affairs in 1987, but shows the trend.

	1978	1982	1984
Segregate Smokers/Non-Smokers in Eating Places	73%	84%	90%
Segregate Smokers/Non-Smokers in Work Places	61%	65%	68%
Ambient Smoke Probably Hazardous to Non-Smokers	58%	65%	68%
Smokers <u>frequently</u> uncomfortable smoking around others	13%	14%	18%

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When this is coupled with the fact that smokers are a non militant, shrinking minority, it is easy to discern why zealots and politicians can use them for "target practice" with little concern.

From the social acceptability issue, which is founded largely on the purported harm of ETS to the non-smoker, have proceeded the restriction measures. The following summary table indicates that these legislative measures are meeting with increasing success.

Smoking Restriction Bills	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
Debated	158	155	165	207	228	374	387
Enacted	32	45	44	67	66	80	149

These laws are focused on the state and local level - workplace or restaurants in general. The full page TI table attached at the end of this memo shows the diverse effects of such laws on a state by state basis. In addition to this, ~50% of employers surveyed had or were considering workplace smoking restrictions. It is of concern that large numerical advances in workplace/restaurant bans are being made in nationwide "trendsetter" states such as California.

Since the current decrease in social acceptability, and all the negatives it entails, is based on the powerful ETS weapon, we have also enclosed a one page summary on this subject as a second attachment to this memo. It is apparent that the effects of ETS on others is now the most powerful anti-smoking weapon being employed against the industry.

2. Product Liability

Almost half of the 130 pending product liability suits involve PM and thus this issue is of substantial interest to us. Apparently most of the suits fall in one or more of three categories of legal arguments.

- A. Product dangers and failure to warn of the dangers.
- B. Undermining the required warning - by various forms of promotion and by challenging health data.
- C. Causality of illness and addiction to the product such that stopping became impossible.

In the unlikely (but possible) event of plaintiffs winning some of these cases, a deluge of suits would be spurred on by "hungry" lawyers. It is possible that at some point in time a significant portion of the retail sales price of cigarettes would be required to fund these suits and related damage awards, i.e., a significant price increase would be necessary.

The only encouraging trend here is the general public revolt against large damage awards and the movement to reform state laws on liability.

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3. Cigarette Taxation

This is a complicated but critical issue. Cigarettes are not only taxed at the federal level but at the state and possibly local level. To the extent that governmental bodies tend to regard this tax as a "cash ~~flow~~" there is a degree of reluctance to destroy the industry. Also, many realize this is a very regressive tax, which tends to restrain some legislators (except the zealots). The problem with tax increases is that it does decrease consumption, just as desired by the social engineers posing these increases want to see.

It is a fact of life that the State and Federal Excise taxes move in only one direction - up. The average state tax rate table below suggests that a large federal increase is more of a problem than the generally smaller increases enacted at the state and local level in the last few years. The federal budget deficit, and the lack of vigorous opposition from the White House, makes a federal excise tax increase a real possibility in the near future.

State Average Tax Rate	
Current	<u>18.25</u>
June 30, 1986	<u>17.32</u>
June 30, 1985	<u>15.77</u>
June 30, 1984	<u>15.44</u>
June 30, 1983	<u>14.54</u>

A separate but related issue is the pressure from some quarters to replace the current excise tax with an Ad Valorem tax - an incremental percentage of the sale price. This is a serious issue for one competitive reason - it would tend to increase the price advantage of the generic versus full margin markets. Hawaii is the only state at present with such a tax.

4. Advertising and Promotion

The cigarette industry accepted a total ban on television and radio advertising in 1972. Opponents of cigarette use have convinced themselves (and some others) that a total ban on advertising would undermine the industry. It is by no means certain that the Supreme Court would not uphold such a law, despite the commercial speech interpretation of the First Amendment.

- The anti-smoking effort rests on a number of assertions, such as:
- Cigarettes are more heavily advertised than any other product.
 - This heavy advertising induces non-smokers, especially young people, to smoke.
 - Taxpayers subsidize tobacco ads.
 - Ads are deceptive since they lower awareness of health risks.

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Each of these arguments can be rebutted by facts, but it is of some concern that there is a moderate level of support for such bans. A total ban would be particularly damaging since it would channel competitive forces into areas such as low price and could possibly destabilize current market shares. Such proposals at the state and local level are making very little progress.

Another aspect of cigarette promotion is state and local sampling laws. Since 1966, 14 states have considered sampling ban bills, but none has banned sampling to adults. There have been some local level actions to ban sampling even to consenting adults. The number of these restrictions at present, in comparison to other industry challenges, does not present a major issue.

5. "Self-Extinguishing" Cigarette Legislation

Cigarettes continue to be associated with a large number of fires, many of which cause loss of life and property. It is not known if the technology exists to make cigarettes self extinguish, but this does not prevent a number of states from at least considering legislating such a product into existence. The federal feasibility study, mandated by Congress in 1984, has slowed down activity at the state level in the last three years.

On October 30, 1987, the study groups final report is due. Depending on this report there could be actions at either the federal level or worse, numerous differing state level regulations.

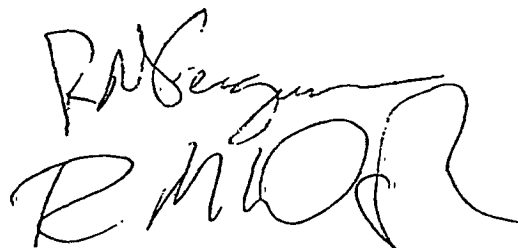
If legislation is passed it would probably be necessary to modify several aspects of current cigarette construction. This could have a negative impact on per unit costs. Of more concern, it would be hard to maintain the subjective acceptability of our major brands if design changes were legislated into these products. This is particularly unfortunate since there is really little reason to expect any increase in fire safety without some nationwide effort to treat fabrics with fire retardant chemicals.

Summary

The increased success of anti-smoking forces at undermining the social acceptability of smoking is a real and present challenge for our industry. Rebuttal is crucial but reversal of the flow of events depicted here is unlikely. This gloomy picture of 1987 and beyond must be interpreted in terms of opportunity as well as challenge. The very importance of the above issues suggest that products which can successfully address some or all of these needs can still be very successful. A threat to the industry can be an opportunity for the company which can find consumer acceptable answers to the types of challenges discussed in this memo.

/ds

Enclosures



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Status

Environmental Tobacco Smoke (ETS) (aka passive smoking, ambient smoke, sidestream smoke, and involuntary smoking) has been a legal issue since 1975 when eight states enacted restrictions on smoking in public places other than elevators. These early smoking restrictions were motivated primarily by the annoyance rather than any scientific evidence of health effects. However, the anti-smokers and media attention given to the purported effects of ETS on health have persuaded forty states, over 600 localities, and hundreds of businesses to restrict smoking in the workplace and other public places. The federal government is considering banning smoking on commercial flights, among military personnel, and in government buildings. The 1986 Surgeon General's Report asserted that ETS "can cause" lung cancer in non-smokers.

Summary Arguments

The first Surgeon General's Report on Smoking and Health in 1964 addressed (ETS), but admitted that more research was needed. The 1979 Surgeon General Report stated that "healthy nonsmokers exposed to cigarette smoke have little or no physiological response to smoke." This report also called for more research. Between 1983 and 1984, 65 internationally known physicians and scientists met three times to address the health effects of passive smoking and concluded, collectively and independently, that no conclusion can be made about whether (ETS) has any health effect on nonsmokers.

In 1986 reports of the National Research Council and the Surgeon General clearly rejected any significant connection between non-smoker ETS exposure and cardiovascular disease, chronic obstructive lung disease or acute respiratory disease (asthma). The Surgeon General's report did assert that ETS exposure "can cause lung cancer" in non-smokers. However, that conclusion was largely political in character. Of the 13 studies reviewed by the report, only 3 showed any statistically significant relation between ETS exposure and lung cancer in non-smokers. These studies are tainted by misclassification of former smokers as non-smokers which accounts for all the supposed ETS related lung cancer. Moreover, in a private communication to a public health official in January 1986, the Surgeon General admitted that the "currently available data do not support a conclusion that exposure to environmental tobacco smoke represents a health hazard."

Finally, none of the 3 studies examined ETS exposure effects outside the home. Indeed, if ETS were treated as any other environmental pollutant, the EPA would impose no restriction on exposure because its health effects are negligible.

Impact

The ETS issue has become the principal force behind the anti-smoking movement's effort to proscribe smoking and ostracize smokers. Despite its non-effect on non-smokers, ETS is the most powerful weapon the zealots have in their crusade.

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STATE
SMOKING RESTRICTION LAWS
January 1987

The Tobacco Institute
State Activities Division

State	Any Public Bldg. Posted As No Smoking	Elevators	Public Trans- portation	Educational Facilities	Cultural Facilities	Health Care Facilities	Govt. Owned Bldg./Public Meetings	Food Stores	Retail Stores	Restaurants	Workplace- Government	Workplace- Private Sector
ALABAMA	•	•	•	•	•	•	•	•		•	•	
ALASKA		•	•	•	•	•	•					
ARIZONA		•	•	•	•	•	•					
ARKANSAS			•	•	•	•	•					
CALIFORNIA		•	•	•	•	•	•	•				•
COLORADO	•	•	•	•	•	•	•			•		
CONNECTICUT		•	•	•	•	•	•	•		•		•
DELAWARE			•	•	•	•	•			•		
FLORIDA		•	•	•	•	•	•	•	•	•		•
GEORGIA	•	•	•				•					
HAWAII							•					
IDaho		•	•	•	•	•	•	•	•	•		
ILLINOIS												
INDIANA			•									
IOWA		•	•		•	•	•					
KANSAS		•	•		•	•	•					
KENTUCKY				•	•							
LOUISIANA					•							
MAINE	•					•	•		•			•
MASSACHUSETTS		•	•		•	•	•	•				
MICHIGAN		•	•	•	•	•	•	•		•	•	
MINNESOTA	•	•		•	•	•	•	•	•	•		•
MISSISSIPPI			•									
MISSOURI												
MONTANA		•	•	•	•	•	•	•	•	•		•
NEBRASKA		•	•	•	•	•	•	•	•	•		•
NEVADA		•	•		•	•	•					
NEW HAMPSHIRE		•	•	•	•	•	•	•	•			•
NEW JERSEY	•	•	•	•	•	•	•	•				•
NEW MEXICO												
NEW YORK			•		•							
NORTH CAROLINA												
NORTH DAKOTA	•	•	•	•	•	•	•			•		
OHIO		•	•	•	•	•	•					
OKLAHOMA		•	•	•	•	•	•					
OREGON	•	•	•	•	•	•	•	•	•	•	•	
PENNSYLVANIA												
RHODE ISLAND		•	•	•	•	•	•	•	•	•		•
SOUTH CAROLINA												
SOUTH DAKOTA		•	•	•	•	•	•					
TENNESSEE												
TEXAS		•	•	•	•	•	•					
UTAH	•	•	•	•	•	•	•	•	•	•	•	•
VERMONT	•						•					
VIRGINIA												
WASHINGTON*		•	•	•	•	•	•	•	•	•		
WEST VIRGINIA			•									
WISCONSIN		•	•	•		•	•	•	•	•	•	
WYOMING												
41 States	13	28	32	23	27	30	25	17	12	15	17	10
D.C.		•				•			•			

Fire Prevention
Laws are not
included.

* Local Authorizing
Statute

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APPENDIX D

Initial List of Potential Needed Technology at R&D

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<u>GOAL</u>	<u>NEEDED TECHNOLOGY</u>	<u>WHERE</u>
Menthol Products	Menthol Storage Release Consumer Mapping Other Cooling Compounds Other Flavor	In-House/Contract In-House/Consultants In-House/Vendors
ART	Dense Gas Thermodynamics Corrosion Chemical Engineering Biotechnology	In-House/Consultants Contract In-House In-House/Contract/ Consultants
Low Activity	Bio-Chem. Testing Chem. Kinetics Bio-Tech Dense Gas Thermodynamics Selective Chemical "Filtration" Combustion/Pyrolysis	In-House Contract In-House In-House/Contract In-House/Consultants In-House In-House/Consultants
Reduced Density	Adhesives / Adhesion Math Simulation Mech. Engineering Combustion/Pyrolysis Aerosol Physics	In-House/Contract In-House/Consultant In-House In-House/Consultants In-House/Contract
Low Ignition	Heat/Mass Transfer Math Simulation Flavor Dev. Combustion/Pyrolysis	In-House In-House In-House In-House/Consultants
Cigarette Alternative	Flavor Dev. Aerosol Generation Aerosol Chemistry Aerosol Taste Consumer Mapping Biological Activity Health Aspects	In-House In-House In-House/Contract In-House In-House/Consultants In-House/Contract Consultants
Sidestream	Aerosol Physics Aerosol Nuc.	In-House/Contract Contract/In-House

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	Wrapper Design Combustion/Pyrolysis	In-House/Vendors In-House/Consultants
High Speed Inspection	Optical Processing Sensor Technology Mech./Elec. Engineering Computer Technology Remote Sensing	In-House/Contract In-House/Consultants In-House In-House In-House/Contract Consultants
Closed Loop Control	High Speed Processing Electrical Engineering Remote Sensing	In-House/Consultants In-House In-House/Contract Consultants
Weight Reduction	Mechanical Engr. Adhesives / Adhesion Math. Simulation Biotechnology Reprocessed Tobacco	In-House In-House/Contract In-House/Consultant
Tailored Taste	Consumer Mapping Flavor Chem. Organic Chem. Structure/Flavor Mechanisms Dense Gas Thermodynamics Local Tobaccos Selective Filtration Subjective Mapping Selective Chemical "Filtration" Chemisorption Combustion/Pyrolysis Aerosol Physics	In-House/Consultants In-House In-House In-House/Contracts, In-House/Consultants Consultants In-House In-House In-House Consultants In-House/Consultants In-House/Contract
Low X Product	Selective Filtration Selective Chemical "Filtration" Dense Gas Thermodynamics Catalysis Separation Science SCE	Consultant/Contract/ In-House In-House/Consultants In-House/Contracts In-House Consultants/In-House
Designed High Speed Products	Adhesives / Adhesion Paper Physical Properties Properties & Filter	In-House/Contracts Consultants/In-House In-House/Consultants
Operations Support	As Needed	

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State-of-the Art
Awareness

Plant Biochemistry
Protein Engineering
Enzyme Chemistry
Computer Science
Molecular Properties vs
Biological Response
Analytical Techniques

In-House/Contract
Contract
In-House/Contract
In-House/Consultants
In-House/Consultants
Contracts
In-House/Contract

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